

F O S S I L S
A R R A N G E D
ACCORDING TO THEIR 17 Lk
OBVIOUS CHARACTERS;

WITH THEIR
HISTORY AND DESCRIPTION;

UNDER THE ARTICLES OF
F O R M, SURFACE,
H A R D N E S S, COLOUR, AND
W E I G H T, QUALITIES;

The PLACE of their PRODUCTION,
THEIR USES,

A N D

Distinctive ENGLISH, and Classical LATIN NAMES.

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F O S S I L S

A R K A N S A S

IN THE
O R I G I N A L C H A R A C T E R S

WITH

HISTORICAL AND GEOGRAPHICAL

NOTES
BY
JOS. BANKS

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INTRODUCTION.

THE purpose here is to lay down an arrangement of Fossils; founded on their obvious characters, and sensible qualities: according to which they may be known, and disposed in method; without the skill of Chemistry, or the fatigue of experiments: without furnaces, or aqua fortis.

Those arts and instruments may be needful to ascertain their nature; but we are here employed only on their outward form, and character: the other part of the science, which is indeed the most essential, will follow the more easily: for things, before they are deeply examined, ought first to be known.

In this method nothing will be admitted as an article of distinction, but what is to be perceived at once, by the sight, smell, taste, or touch. Good sense alone will be required to arrange Fossils according to these palpable and unerring guides; and the system will serve for all cabi-

nets; because it comprehends all the Fossils that are known to exist.

From these determinations alone of our senses, will be given a detail of the differences we find in Fossils; under the heads of Form, Hardness, Weight, Surface, Colour, and Qualities, as distinguished by the taste, smell, or touch.

These distinctive marks will be disposed separately in so many columns; and to these will be added two more for the history of the bodies: comprehending the place where they are found; and uses to which they serve.

Thus the few words in our six first columns read together, will give the *Specific Character* of every Fossil: and those of the two last will add what is essential in its history and value.

A Table of Classes will be prefixed to all; in which the method will appear at one View.

The distinction of each Class will be added at the head of each: and after this, subordinate characters of the several genera. These, like the rest, will be founded only on obvious characters; and from these the detail of species will be regularly pursued.

These

INTRODUCTION.

These Characters cannot be so absolute and determinate, as those which mark the like great distinctions among Animals and Vegetables. It is impossible they should: Fossils, not being organic bodies, produced by eggs or seeds, are not themselves so determinate and distinct: and it would be preposterous to attempt in the distribution, what nature has not done in their construction.

The greater distinctions are the nearest being absolute; for so much the simplicity of nature in these bodies allows: all subordinate differences are less determinate; and the lower we descend, the more equivocal must be the marks. The Characters of Genera therefore are liable to exception often; and those of what we are content to call Species, in this Kingdom, always.

The great and essential difference of Species and Variety, so useful in Plants, is lost in Fossils; it would be happy if it were otherwise: but 'tis idle to speak of things any way but as they are.

The terms of difference between Species and Species, are every where expressed at the heads of the several columns; and these are all placed in each Page, because usually most of them are requisite; though 'tis according

to the general nature of the bodies, that one or other of them becomes most essential: each Class has its different qualities, that more or less determine the Species of the objects it comprehends; and in this way all the marks are always ready.

Thus in *Stones*, the Characters of FORM, HARDNESS, WEIGHT, and SURFACE, are most essential; among the *Crystals* and *Spars*, FORM and COLOUR; with *Earths* and with the *Talcs*, FATTINESS; in the *Salts*, TASTE; and with the *Sulphurs*, SMELL. The terms of place belong to all; and (where they have been brought to serve the purpose of Life,) their uses.

In the application of these terms to the several Fossils, they are always given comparatively; and have reference to the other Bodies of the same Genus. The Classes separate very different things from one another; and the lesser distinction of Genus yet farther divides those of each alliance: the Character of the Class, and that of the Genus, are always to be carried in the mind, in addition to the distinctive mark of the Species: and as the articles expressed in our columns are intended to refer only to the Fossils of the same name, when 'tis said that bodies are hard, or soft, light, or heavy, it means nothing absolute; but is only to be under-

understood as hard, or soft, in comparison of others of that kind : and so of all the rest.

In the same manner the article of place is not meant as singular, or particular ; for many Fossils are in a manner universal : 'tis only intended to say, that such or such a Country is one of those where this or that Fossil is found.

With respect to other Authors, their systems have been founded on principles so different from those which direct all things in this, that references to them are not very necessary : the information intended to be given here, is meant to be conveyed at once ; and to be itself sufficient for the distinctive knowledge of the body. However, to comply with custom ; and mark the way to farther enquiry, the name of the Author, who seems to have best understood the body in question, is annexed always to its Latin name, by the initial letter. The Reader will be pleased therefore to know, that in these places,

W stands for Wallerius.

B for Bomare.

L for Linnæus.

H for my history of Fossils.

And that where the letter N is added, the Body described is a new Species.

As

As I have had the advantage of more than twenty years experience since the publication of the Book just named; I find I shall have many Species to add, which were not known at all at that time; and several to retrench, which are better known now: and where the same faithful guide directs me, I shall not scruple to take the same liberty with the opinions of others, as to the Species; that I have taken with my own.

Large Histories may be written on the nature of the several subjects; but the purpose here is nothing more than that previous acquaintance with the Bodies, which is the first essential enquiry: the plan is to make that as certain, as obvious, and as familiar, as the nature of the subject will admit: and of all things, to express it in as few words as possible.

The annexed table will give the course of the arrangement that is to be used: in which, it seems essential to begin with the simplest bodies: for otherwise, 'tis impossible to comprehend the description of those which are composed of several kinds.

NATIVE

NATIVE FOSSILS.

 CLASS I.

TALC.

TALCUM.

A pure Fossil : composed of flexible and elastic
Plates.

TALC is LIABLE TO BE tinged by mineral Steams ;
clouded by subterranean Fires ;
fouled by admixture of earths ;
broken by the force it suffered while among
fluid Matter ;
distorted by the concretion of Stones, in which
it lies ;
debas'd by an admixture of their Matter ;
and intermixed with similar Fossils.

Hence, tho' naturally transparent, it becomes some-
times opaque ; alters its form ; and loses in like manner of
its flexibility.

Therefore Talc, in the condition we see it in the earth,
is to be separated into various Genera, and Species ; ac-
cording to those differences, and other accidents.

B

TALC.

T A L C.

G E N U S I.

I S I N G L A S S.

V I T R U M.

Composed of broad, flat, close, polished Plates.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. MUSCOVY ISINGLASS.							
In broad masses	the plates flexible	very light	glossy	BROWNISH	soft	Russia, in rocks	Mica Membranacea. W. for windows, lanterns, &c.
2. DANISH ISINGLASS.							
Large thick masses	plates tough	heavy	shining	WHITISH	fatty	Denmark, Sweden, Norway	Mica Laminosa. L. windows.
3. INDIAN ISINGLASS.							
Thin cakes	plates most flexible	very light	polished	PALE YELLOW	unctuous	Coromandel	Verre de Museovic jauné. B. as glass.
4. PERSIAN ISINGLASS.							
Round lumps	plates elastic	quivering	shivery	PALE RED	smooth	Island of Ormus, in red earth	Vitrum Perficatum. H. covering miniatures.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
5. FRENCH ISINGLASS.							
Broad cakes	plates scarce elastic	heavy	undulated	BROWN	fatty	Champaign, in rocks, by rivers	Vitrum Gallicum. H. as glass, but poorly.
6. ICELAND ISINGLASS.							
Broad masses	plates brittle	light	shivery	WHITE	harsh	Mount He- cla	Vitrum Mandicum. N.
7. HUNGARIAN ISINGLASS.							
Irregular lumps	plates brittle	heavy	scaly	YELLOW	unctuous	Cremnitz, in mines	Mica Hungarica. L.
8. ORPIMENT ISINGLASS. ORPIMENT.							
Uneven masses	plates brittle	heavy	undulated	GREENISH YELLOW	fatty, sulphureous	Saxony, in mines	Vitrum Auripigmentum. H. a yellow paint

T A L C.

G E N U S II.

G L I M M E R.

M I C A.

Composed of small, loose, irregular, shining Scales.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. GOLD GLIMMER.							
In small rough masses	rigid	heavy	scaly	YELLOW.	dry	Germany *	Mica Aurea. W.
2. SILVER GLIMMER.							
Larger uneven lumps.	flexible	light	wavy	WHITE	fatty	Germany	Mica Argentea. W.
3. GREEN GLIMMER.							
Small rough lumps	hard	heavy	scaly	BRIGHT GREEN	harsh	Germany, in mines	Mica Viridis. W.
4. BLACK GLIMMER.							
Great rugged lumps	very hard	heavy	oblong and streaky	BLACK	harsh	Denmark, in mines	Mica Decussata. L.
5. RED GLIMMER.							
In small rude lumps	tender	heavy	rugged	RUDDY	fattyish	Saxony, in mines	Mica Rubra. W.

6. VENETIAN GLIMMER.

VENICE TALC.

In uneven masses	soft	heavy
---------------------	------	-------

7. CONVEX GLIMMER.

In small half- round lumps	tender	light
-------------------------------	--------	-------

8. UPRIGHT GLIMMER.

Large and uneven	stony	heavy
---------------------	-------	-------

9. TWISTED GLIMMER.

Rude masses	soft	heavy
-------------	------	-------

10. STREAKY GLIMMER.

Flat pieces	brittle	heavy
-------------	---------	-------

Mica Talcosa.
L.

a cosmetic.

Mica Hæmipherica.
W.Mica Crystallina.
L.Mica Undulata.
W.Mica Radiata.
W.Norberg,
in rocksFinland,
in claySweden,
in minesHartz forest,
in minesSaxony,
in rocks

most fatty

smooth

harsh

fatty

dry

GREENISH
WHITE

SILVERY

WHITISH

YELLOW

GREY

undulated

coated

rais'd,
three-cor-
ner'd, split

wavy

thready

• Perhaps this is the Mica Nigra, calcined by subterranean Fires ; for that becomes yellow, when burnt.

T A L C.

G E N U S III.

B L A C K L E A D.

M O L Y B D Æ N U M.

Composed of minute, fatty, irregular, and close-connected Scales, staining the hands.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. PURE BLACK LEAD.							
Compact	tender	light	smooth	GLOSSY BLACK	fatty	England and Germany, in hills	Molybdenum Impalpabile, L. lead pencils.
2. SCALY BLACK LEAD.							
Brittle	soft	heavy	tilly	DEAD BLACK	smooth	Sweden, in mountains	Molybdenum Subsquamosum, L. pencils.
3. PLATED BLACK LEAD.							
Shattery	brittle	light	uneven	GREY BLACK	soft	Germany, in mines	Molybdenum Sablairelliosum, L. pencils.
4. DUSTY BLACK LEAD.							
Scoty	firm	heavy	rough	BLACK	dry	Goffelaer, in mines	Molybdenum Compactum, L. a black paint.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
5. PERPLEX'D BLACK LEAD.							
Streaky	hard	heavy	thready	BLACK	rough	France, in rocks	Molybdenum Intricatum. L. a blacking
6. RADIATED BLACK LEAD.							
Streaked	hard	heavy	raised in ridges	GREYISH BLACK	dry	Sweden, in mines	Molybdenum Radiatum. L. for colouring earthen ware
7. KIDNEY BLACK LEAD.							
Chaffy	soft	light	dufty	DEAD BLACK	dry	Germany	Molybdenum Reniforme. L. for crucibles

8. SANDY BLACK LEAD.

Rugged

crumbly

heavy

uneven

BROWN
BLACK

harsh

Banks of the
Rhine

a coarse colour.

Molybdæna
Impura.
W.

9. WOLF BLACK LEAD.

Uneven

soft

very
heavy

wavy

REDDISH
BLACK

very
unctuous

Westmore-
land, in the
hills.

a good ordinary
colour.

Molybdenum
Sperma Lupi.
L.

C
N

10. DINGY BLACK LEAD.

Gritty

very hard

heavy

confused

GREYISH
BLACK

unctuous

Upland

Molybdæna
Tefularis.
W.

11. BRIGHT BLACK LEAD.

Flaky

hard

heavy

raised in
dice

YELLOWISH
BLACK

fatty

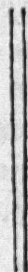
Bohemia

Talcum
Cubicum.
B.

THE Structure of these, and the Bodies of the three following Genera, are best seen in the sides of rough masses ; rude as they are taken from the earth : where these are wanting, it is best seen in a piece newly broken, viewed crosswise.

In general, where the eye is not able to see it plainly, a reading-glass is to be used ; and for the most confused kinds, a glass of more power.

T A L C.



G E N U S IV.

S O A P R O C K.

S M E C T I S.

Composed of small, regular, fatty, tender, and close-connected Flakes; formed into a compact smooth mass.

WE shall begin to see, in this Genus, and from thence be led perfectly, in the three succeeding ones, to distinguish the way by which Nature gradually descends, from the purity and perfection of the finer Bodies in each Class; to those so foul, and imperfect, that we at last lose sight of what they are.

The opake black Touchstone differs as much from the bright Russian Isinglass, as one thing well can differ in its aspect from another: yet, when all are thus traced through their gradations, we cannot doubt but it is the last of Talc.

The Characters of these Fossils are plainest in the purest; the Isinglass: but even there, the Hecla kind loses its transparence. They begin to degenerate in the Glimmers; they are yet less distinct in the Black Leads; and in these Soaprocks, and the succeeding Genera, the eye scarce perceives the plated structure: but still they are, in all, the same. Unformed Talc, or the substance of the Talc, not formed into plates, often mixes with their flakes; and confuses them: but having seen these flakes in the purest Isinglass, they will be traced by the eye a great way thro' the Glimmers: a little assistance will shew them in Black Lead, and even in all these: and all the while, their smoothness to the touch, and fatty quality, deduced only from their broken plates, declare them every where.

The more opake of these Bodies will be repeated under the head of hardened earths, &c. with references to their just place here: and this seems as much as Nature allows to the methodical arrangement of Fossils; which have not been formed with those absolute and distinctive characters we trace in the two higher orders of created Bodies.

SOAPROCK.

S O A P R O C K.

[23]

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
1. CORNSH SOAPROCK.							
In rude lumps	tender	heavy	marbled	RED AND WHITE	very fatty	Cornwall	Talcum Smeëtis Opacum. L. for porcelain.
2. CHINA SOAPROCK.							
In great masses	hard	heavy	rugged	GREYISH WHITE	fatty	China	Talcum Smeëtis Steatites. L. in the fine porcelain.
3. SWEDISH SOAPROCK.							
Flat cakes	soft	light	polished	RUDDY	very fatty	Sweden	Talcum Smeëtis Lamellosum. L. cleaning woollen cloths.
4. GERMAN SOAPROCK.							
In small lumps	tender	light	rugged	WHITE SPOTTED WITH RED	soft	Hartz forest	Talcum Smeëtis Subdiaphanum. L. cleaning woollen cloths.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
5. GREY PLATED SOAPROCK.							
Flat cakes	brittle	heavy	smooth	GREYISH	fatty	Sweden	Talcum Lamellare. L. for marking.
6. BLACK PLATED SOAPROCK.							
In thick cakes	very hard	very heavy	smooth and polished	BLACK	oily	Germany	Talcum Corneum. L. for marking.
7. LEATHER SOAPROCK.							
In thin cakes	soft	light	uneven	PALE BROWN	fatty	Sweden	Talcum Coriaceum. L.
8. ROSE SOAPROCK.							
Rude lumps	tender	heavy	raised in convex flakes	ROSE-CO- LOUR	very soft	Sweden	Talcum Carneum. L. cleaning wool.

9. GREEN SOAPROCK.

Uneven lumps	soft	very heavy
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10. RED SOAPROCK.

Vast masses	soft	heavy
-------------	------	-------

11. WHITE SOAPROCK.

Flat masses	soft	light
-------------	------	-------

12. FRENCH SOAPROCK.
FRENCH CHALK.

In great flattened lumps	hard	heavy
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13. SPOTTED SOAPROCK.

Small flattened lumps	soft	light
-----------------------	------	-------

Talcum
Viridans.
L.

Talcum
Rubrica.
L.

Talcum
Lithomarga.
L.

Le Talc Vert
de Briançon.
B.

Le Talc Vert
Marbré,
B.

Germany

for marking.

England

Switzerland

for marking.

France

for cleaning
cloaths.

France

dry

fatty

fatty

very fatty

fatty

DEEP
GREEN

DULL RED

WHITISH

GREENISH
WHITE

GREY AND
GREEN

dufty

uneven

dufty

smooth

uneven

T A L C.

G E N U S V.

P O T S T O N E.

O L L A R I S.

Composed of broad, narrow, and uneven Flakes, mixed irregularly together.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. SOAPY POTSTONE.							
Great masses	hard	very heavy	uneven	MOTTLED GREY AND GREEN	fatty	Sweden	Pierre Ollaïre, W. for vessels to bear the fire: it hardens to a stone in burning.
2. TENDER POTSTONE.							
Rude masses	soft	heavy	irregular	GREY AND RUDDY	very fatty	Switzerland	Pierre de Côme, B. for pots to bear the fire.
3. COARSE POTSTONE.							
Large masses	hard	heavy	scaly	GREY AND BLACK	dry and harsh	Germany	Pierre Ollaïre à gros grains, B. for furnaces.

T A L C.



G E N U S VI.

C O L U B R I N E.

C O L U B R I N U S.

Composed of small, flat, thick, even, and close-connected Flakes.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. SOFT COLUBRINE.							
In flat masses	soft	light	uneven	OLIVE-COLOURED	very fatty	Salberg	La Colubrine tendre. B. for ornaments.
2. HARD COLUBRINE.							
Rude masses	very hard	heavy	rugged	IRON-GREY	fatty	Germany	La Colubrine dure. B. for furnaces.
3. LOOSE COLUBRINE.							
Flat masses	hard	heavy	flaky	GREENISH	fatty	Salberg	Lapis Colubrinas Lamellofus. B. for furnaces.

ALL the Colubrines cut easily, but will take no polish.

If it were not for the last Species, it would have been hard to know the Colubrines were Talc: but here we evidently see the plates; though they will not separate.

In this, and in the Soaprocks, and the Potstones, all is Talc, though mixed and crushed together. These afford instances of Talc fouled with Earth; but still 'tis talcy Earth; and perhaps unformed Talc: and in the Ollaris, in particular, we see it in the most mixed state of all; with unformed earthy Talc, and talcy Fibres.

T A L C.

G E N U S VII.

S E R P E N T I N E.

S E R P E N T I N U S.

Composed of Plates connected in small lumps, and mixed with unformed Talc.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
1. DARK SERPENTINE.							
In great lumps	very hard	very heavy	rugged	MARbled OF GREEN AND BLACK	dry	Finland	Talcum Serpentinus. L. for marble mor- tars.
2. BRIGHT SERPENTINE.							
In vast masses	hard	heavy	half-po- lished	MARbled OF DARK GREEN AND WHITE	fatty	Germany	La Serpentine demi transparent. B. for ornaments.
3. TREADY SERPENTINE. NEPHRITIC STONE.							
In large lumps	hard	very heavy	bright	LIGHT GREEN	fatty	America	Talcum Nephriticus. L. in medicine, for the gravel.
4. BLACK SERPENTINE. TOUCHSTONE.							
In vast rude masses	hard	heavy	smooth	BLACK	fatty	Silesia	Lapis Metallorum. W. for trying metals.

NATIVE FOSSILS.

CLASS II.

SELENITE.

SELENITES.

Composed of flexible, but not elastic Plates.

SELENITE is softer than Spar; less weighty, and somewhat less transparent.

Its Plates break into Rhombs; and when it crystallizes free and pure, this is its natural and original form.

We find it transparent, of various Figures; but composed all of united Rhombs: and when its concretion has been interrupted, we see it in the forms of granulated, fibrous, or scaly masses, and call them *Gypsa*, or *Plaster Stones*.

The substance is the same in all; for Selenite, like Spar, is but one thing, one substance; and whether we find it pure in beds of clay, or coating walls, or hanging in Icicles from the roofs of caverns; whether compact as marble, or loose as powder, still the substance is one: it proves the same on the severest trials; and when carefully disuniting, and
viewed

viewed before the microscope, its particles are all plated, watery, and rhombic.

Selenite therefore is one thing; one substance, in all its variety of forms: and 'tis but idle to divide its different appearances under the affected double terms of Species and Varieties. The laws of Botany cannot be justly extended to Fossils; because they are not organized bodies, or raised from seeds: in all its forms this is one thing; and the whole purpose here is to lay down its different appearances, for their disposition in a cabinet.

This Treatise is written for the arrangement of one great Collection; if it serves others, so much the better; but that is all its purpose.

We find even Arsenic in Selenites; nor did I ever see one without iron; and this, as more or less, causes a variety of forms: but still 'tis the one substance. Selenite thus alter'd; and thrown, by means we know, into these appearances; and the term Species belongs to none of them: we use it for convenience of distinction; but must not dispute about its propriety.

ORIGIN of SELENITE.

SELENITE is composed of an Alkaline Earth, saturated with the Acid of Vitriol.

We know this: for we can make something very like it by art this way: 'tis pity we cannot do this exactly. We have its nature in these artificial bodies, but not its form. We can produce a Salt with all the properties of Selenite; and this, among the rest, that when well made, we can't again dissolve it: but I have never succeeded so far as to get this Salt in its Rhombic form: we have it in striated masses, and in clustered flakes; and in the same forms we have also natural Selenite. Art imitates the more imperfect and disturbed crystallizations of nature in this substance; and 'tis as much as we can expect from it; we cannot give the pure and perfect forms of nature.

Selenite will not strike fire with steel; for 'tis so soft, we crush it between the fingers: it will not ferment with acids, for 'tis a neutral Body in its nature; an earth capable of fermenting with them, but already saturated. Some kinds effervesce slightly, but 'tis from a mixture of Spar; for nature makes her saturations accurately. Cronstedt most justly talks of iron in some kinds; I find it, as already said, in all; nor is there any end of the variety of other mixtures.

Selenite falls into powder by a very slight heat : and, as 'tis said, may be dissolved and recrystallized. I hope it is so ; but have not found the way to perfect it in my own trials. This powder hardens with water ; but without heat, or what we call, flaking.

'Tis strange Wallerius should suppose the Selenite Bodies not to break into Rhombs : 'tis constant, and 'tis of their character ; they differ in this from Talcs, whose flakes will never break into any form, tho' they will split for ever. They are simple ; and are the very idea of mathematical extension, breadth without thickness.

SELENITES.

ORDER I.

SELENITE.

SELENITES RHOMBICUS.

In form of simple or united Rhombs, variously connected.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. CLEAR SELENITE.							
Perfect clean Rhomb of ten sides	tender	light	polish'd	PELLUCID	clean edged	Oxfordshire, in clay	Natrum Selenites. L. for grottos.
2. WHITE SELENITE.							
Thick, rude Rhomb of ten sides.	hard	light	rugged	MILKY	scaly edged	Northamptonshire, in clay pits	Selenites Albus. W. a medicine for fluxes.
3. YELLOW SELENITE.							
A clean thin Rhomb of ten sides	very soft	heavy	polish'd	PALE YELLOW	shattery	Leicestershire	Selenites Flavus. W. for grottos.
4. MANY COLOURED SELENITE.							
A prism of fourteen sides	hard	heavy	rugged	WHITISH BROWN, WITH BLUE AND RUDDY VEINS	crackly, feather'd in the centre	Northamptonshire, in clay	Natrum Floride. L. curiosity.

5. BASALTINE SELENITE.

A prism of
six sides,
with two
pyramids

heavy

polished

DUSKY
BROWN

full of
cracks

Norway

curiosity.

Natrum
Balsianum.
P.

6. WEDGE SELENITE.

An arrow
head, form'd
of two
wedges

hard

light

glossy

WHITISH

sharp
edged

France

for scagliola.

7. COMPLEX SELENITE.

A flat
plate of
Rhomb and
Wedges

tender

heavy

polished

COLOUR-
LESS

variously
cracked

Greenwich

for grottos.

Selenites
Compositus.

8. GOLDEN SELENITE.

A cluster
of Wedges

soft

heavy

glossy

PALE
YELLOW

shattery

France

for scagliola.

Draß Gypses
Flava.

SELENITES.

ORDER II.

PLASTER SELENITE.

G Y P S U M.

Composed of numerous small Scales, irregularly laid together.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. WHITE PLAISTER STONE.							
Masses of thick scales	crumbly	very heavy	rough and coarse	DULL WHITE	hard particles	Germany	stucco work. Gypsum Micaceum Cronstedt.
2. GREY PLAISTER STONE.							
Masses of small scales	compact	heavy	rugged	SILVERY GREY	tender particles	Norway	stucco work. Gypsum Micaceum Griseum Cronstedt.
3. YELLOW PLAISTER STONE.							
Masses of thick scales	tender	heavy	uneven	YELLOWISH	small, soft particles	France	stucco work. Gypsum Micaceum Flavum Cronstedt.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
4. RUDDY PLAISTER STONE.							
Vast masses of small scales	soft	very heavy	rugged	PALE RED	friable	Yorkshire	stucco work. Gypsum Rebrum.
5. GLOSSY PLAISTER STONE.							
Bright masses of wav'd scales	friable	heavy	uneven	CLEAR	splitting	Germany	stucco work. Gypsum Pellucidum. W.
6. POWDER PLAISTER STONE.							
White dust	soft	light	granulate	WHITE	dry	Saxony	stucco work. Terra Gypsa Cristallina. W.

SELENIOTES.

ORDER III.

THREADY SELENITE.

GYPSUM STRIATUM.

Composed of long threads, laid one by another.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. WHITE THREADY SELENITE. ENGLISH TALC.							
Broad, fibrous masses	compact	very heavy	even	BRIGHT, BUT WHITISH	splits perpendi- cularly	Yorkshire	Gypsum Striatum. W. for cleaning lace and plate.
2. CLEAR THREADY SELENITE.							
In small masses	tender	heavy	polished	COLOUR; LESS	wavy	Sweden	Gypsum Fibrolum Crassedi.
3. GREENISH THREADY SELENITE.							
Oblong masses	brittle	very heavy	rugged	PALE GREENISH WHITE	flaky	Germany	Le Gypse. Scissile. W.
4. POLISHED THREADY SELENITE.							
Short, small masses	tough	heavy	smooth	PALE OLIVE- COLOUR'D	compact	Norway	Le Gypse Amianthe. W.
5. YELLOW THREADY SELENITE.							
Small clusters	tender	light	bright	PALE YELLOW	filile easily	Sweden	Gypsum Capillare Crassedi.

SELENITES.

ORDER IV.

RADIATED SELENITES.

GYPSUM RADIATUM.

Formed into Rays, or Crests, or Ridges.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
1. STARRY SELENITE. CHEKAO.							
Regular flats	very hard	very heavy	polish'd	PALE BROWN	lucid in the dark after in- solation	In China, and Island of Shepey, on the waxen vein	Gypsum Stellatum. * for china ware.
2. WHITE COCKSCOMB SELENITE. PETUNSE.							
Crusts on balls of Spar.	very hard	heavy	coarse	WHITE	irregular	Germany	Gypsum Crissatum Cristall. * for china ware.
3. RUDDY COCKSCOMB SELENITE.							
Rude lumps	hard	very heavy	smooth	REDDISH	jagged	Sweden	Gypsum Crissatum Rubrum Cristall.

4. BONONIAN SELENITE.

Roundish lumps	hard	very heavy
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5. LIVER SELENITE.

Coarse, scaly lumps	very hard	heavy
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6. BLACK SELENITE.

Small plated masses	hard	heavy
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Phosphorus
Bononiensis.
W.Lapis
Hepaticus
Cronstedt.Hepaticus
Niger
Cronstedt.

Italy

Sweden

Sweden

lucid after
calcina-
tionsulphure-
ous smell
when
struckvery sul-
phureousPALE
BROWNBROWNISH
YELLOW

BLACK

glossy

ridg'd, and
uneven

granulated

• These, and the Soap Rock, seem the great ingredients of the China Porcelane : and we have them all [48]

SELENITES.

ORDER V. CURTAIN'D SELENITE.

SELENITES STIRIATA.

Coating the cracks of plaister pits, in form of folded curtains.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USE S.
1. WHITE CURTAIN'D SELENITE.							
Vast sheets	hard	heavy	wav'd, and glossy	PURE WHITE	shattery	Italy	Stalactites Gypseus Albus Cronstedt. as alabaster.
2. YELLOW CURTAIN'D SELENITE.							
Great sheets	hard	heavy	polish'd	BROWNISH YELLOW	shattery	France	Stalactites Gypseus Flavus Cronstedt. as alabaster.

SELENITES.

ORDER VI.

STALACTICAL SELENITE.

SELENITES STALACTITIUS.

Hanging like Icicles from roofs of hollows.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. CLEAR STALACTICAL SELENITE.							
Short cones	tender	heavy	rumpled, but glossy	COLOUR- LESS	brittle	Italy	Gypsum Spatofum Stalactium Cronstedt.
2. YELLOW STALACTICAL SELENITE.							
Long cones	hard	heavy	circled	YELLOWISH	very brittle	Sicily	Gypsum Spatofum Stalactium Flavum Cronstedt.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
3. WHITE STALACTICAL SELENITE.							
Rude lumps and risings	tender	heavy	botryoide	WHITE	brittle	Sweden	Gypsum Spatofum Stalactium Album Crystall.

S E L E N I T E S.

O R D E R VII.

S T O N Y S E L E N I T E S.

S E L E N I T E S L A P I D E Æ.

In hard, solid, shapeless masses.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. WHITE STONY SELENITE. WHITE ALABASTER.							
Thick masses	tender	heavy	uneven	PURE WHITE	uniform texture	Ægypt	for ornaments.
2. BROWN STONY SELENITE.							
Rude lumps	hard	heavy	scaly	PALE BROWN	shattery	Sicily	Alabastrum Opacum Cronstedt. for ornaments.
3. YELLOW STONY SELENITE.							
Flat cakes	hard	very heavy	even	DULL YELLOW	shattery	Greece	Alabastrum Flavum Cronstedt. for ornaments.
4. AMBER STONY SELENITE.							
Great masses	hard	heavy	wav'd	AMBER- COLOUR'D	compact	Ægypt and Persia	Alabastrum Flavum- Diaphanum Cronstedt. for ornaments.
5. GREEN STONY SELENITE. NEPHRITIC STONE.							
Great masses	hard	heavy	uneven	PALE GREEN, CLOUDED.	greasy	America	Pierre Nephritique W. a supposed medi- cine for the gravel.

FROM Selenite we naturally advance to Spar; and enter upon one of the most intricate, and varied classes of the mineral kingdom.

Some general reflection ought to introduce a subject so important; and under an instance so commanding, and so explanatory of the rest, it may be proper to cast an eye upon the general course of nature, in the Fossil world.

When we have found the real origin of this pure Stone, we shall be led to that of half the concretes that we are about to examine: and when we have seen how this one substance assumes its various forms and colours, we shall judge easily of the rest. 'Tis not impossible to trace this accurately; nor is any thing required to the undertaking but attention to the neighbouring Fossils where it is found; and to the beds thro' which the level of the country, and construction of its strata will shew it must have run before concretion. This observation, carefully made, will give the Philosophic History of its varied appearances; and lay them regularly down in a true natural method: but first we are to understand its origin; and its place in the great chain of beings.

ORIGIN * of SPAR.

THE Series of Fossils make one great circle; for ever returning into itself.

There are a few primitive bodies; Chalk, Clay, Bitumen, Talc, and the Mineral Acid.

These, variously mixed, form many different compound Fossils: which mingling, in some places, farther with one another, give decompositions.

These (in other places) give up their several primitives again to water: which delivers them pure in some other parts; ready to form mixt and compound bodies again.

To trace them thro' these combinations, and to their natural analysis again, is the whole business of the Student in this science: for here is no distinction but by mixture: no origin from egg, or seed.

A great deal of pure Clay mixed with a little quantity of various Stones, forms the different Clays.

And a great deal of Stone with a little of the Clays, forms the various species of Stones.

* Published separately, July 1772, as a Specimen of a method of Fossils.

An instance of this course of nature appears in the philosophic History of Spar.

1. The primitives, as we have seen, are,

Water, Bitumen, Chalk, Clay, Talc, and Mineral Acid :

To these, the operations of the air, and fire give great powers of acting. We thus find

2. *Heavy Vapours*, form'd of air, and much water. These, pervading all things,

3. Meet the Mineral Acid ¹, and uniting with it ; if they run clear to the surface, afford Medicinal springs ; but

4. Thus united, they may fall upon Bitumen : this is no-where more frequent than in Limestone Rocks ; and often stands in puddles, in their natural hollows ².

5. By this mixture, uniting in its course, is form'd a real, tho' a fluid Sulphur : for Sulphur is nothing else ; nor can be form'd by any other means ³.

6. This Sulphur, not yet concreted, passes in its

¹ The Electric Æther of the under world ; present every where, but only seen concentrated, or in its mixtures. It affects some things, Bitumen most : and avoids others.

² At Naples ; in the Venetian Territories ; and in Persia, this is very common.

³ Absolute Sulphur may be made by art with ease and certainty this way. The Acid of Vitriol, with any thing inflammable, affords it.

liquid,

liquid form, thro' the pores of the Limestone; dissolving part of its purer Chalk as it goes ⁴.

7. Water thus saturated with the principles of Sulphur, and with Chalk, keeps on its gradual course horizontally thro' the same Lime Rock, till it meets a fissure; a perpendicular crack, or opening; dividing one part of the rock from another. Here it ouzes forth: and meeting with a lighter air, hangs; and evaporates slowly.

8. Slow evaporation, and perfect rest, are the requisites of crystalization. The Sulphur and pure Chalk thus united, form one solid body; which crystalizing gradually, appears in regular rhomboidal particles: and is the substance we call Spar ⁵.

⁴ Limestone is only coloured, hardened Chalk; and Marble is the same. Marble is a purer Limestone, and Limestone a coarser Marble.

⁵ Spar supposed to be one thing, is therefore a mix'd body, and so are the purest Salts. We can make a substance of the nature of Spar, by crystalizing the lixivium of Lime and Sulphur.

NATIVE FOSSILS.

CLASS III.

SPAR.

SPATUM.

A pure Fossil ; composed of Brittle Rhombs.

SPAR is known from Talc by its want of elasticity ;

—from Selenite by its want of flexibility ;

—from Crystal by its dullness, and by fermenting with Acids.

It is heavier than any of the three other pellucid Fossils ; and is known from all bodies in the world (when pure enough to be seen through) by its doubling lines laid under ; and view'd through it.

This last property has been supposed peculiar to that species of Spar call'd Island Crystal : and the greatest writers, Linnæus, Wallerius, Cronstedt, and the long *et cætera*, have separated that body from the pure Rhombic Spar ; which they supposed not to have the double refraction. But this power resides in all Spar I have examined : and is of its nature : as it arises from the internal construction of the body, which is made up of smaller Rhombs, apply'd one to another.

The

The very atoms of Spar are Rhombic; and those smallest pieces into which it may be separated by gentle Acids, without solution, apply'd to the microscope over a line proportionably fine, have the same power.

No body has this construction except Spar; therefore no other natural or artificial substance has this power of double refraction. Even Sir Isaac Newton has said, Crystal has something of this power; in vain: for no authority can stand against the testimony of the senses. All different mediums vary in refraction; but this peculiar power resides only in a pellucid body formed of connected Rhombs.

The state of refraction in the pellucid natural bodies is this,

1. Talc in thick masses elevates the line.
2. Selenite waves it.
3. Crystal distorts it.
4. Spar gives it double.

All Spar does this, even that which takes the form of Crystal, in Pyramids, and Columns: therefore even the variously angulated forms of Spar are composed of Rhombs; and the construction of Spar, and of Crystal, are perfectly different, even while their forms are the same.

Spar is seldom found original, and free: a few pure Rhombs;

Rhombs; and two Columns, double pointed, which were dug in the Hartz Forest; are all I have of it.

Nature has mixed its particles among the matter of the Marbles and Limestones; from whence it is washed forth by the pervading water, and left slowly by it, in their cracks and fissures; where it assumes these various forms:

1. Pure Rhombs of a larger size.
2. Rude masses, form'd of coarse connected Rhombs.
3. Plates composed of connected Rhombs.
4. Columnar, Pyramidal, and Cubic Figures, fix'd upon the surface of these rude masses.

In this latter case the rude mass continues uncolour'd, and is the Root; and the Columnar or Pyramidal Figures rise from it frequently yellow, often of other colours: these cut into a kind of Gems, but still have the double refraction equally with that part we call the Root.

5. Icicles and Dropstones.

That the Spar form'd in fissures of rocks, is thus wash'd out of the Limestone itself is certain:

Because none but Limestone Rocks have Spar in their fissures; Rocks of a crystalline matter, or form'd of vitrifiable Stone, have Crystal; never Spar in their cracks.

Linnaeus wonders at the nature of that force which split the Rocks into these cracks: but probably the cause is very familiar; they were formed moist, and crack'd in drying.

Spar grows continually; for wheresoever there is a crack in a Limestone Rock, new, or old; Spar always fills it; and over-runs the surface.

Letters cut hollow in a living Rock of Limestone, fill up, in a course of years, with Spar; and what were made in Creux are found in Relief. This has been seen in Gothland by the eminent Swede; and in the grotto of Antiparos by Tournefort. The very time may be determined by the dates, which are often a part of the inscription; but it is always long. The Spar stands higher as the time is more distant: and has been seen in some places a quarter of an inch above the level of the surface.

If there could want a proof of the continual growth of Spar, the Stalactites would shew it; and the incrustations, in what are called our petrifying springs; but that is a fouler sort: there is in Norway a pyramid of Spar two inches long, which was once mine; in which two branches of the solid Heath moss, or Lichen, are perfectly embodied.

It has been thought the Spar in cracks of Rocks was brought from elsewhere by water; or was and is originally in all water: the latter is the opinion of Linnaeus;

Linnaeus; Henkell maintains the former. But if either were the case, Spar would be sometimes found in Vitrescent Rocks, and Crystal in those of Limestone; which observation denies.

Spar they say will be formed where water can be retain'd; but indeed also where it cannot; 'tis enough that it ouzes slowly: nay, not water alone dissolves Spar; [but it can be retain'd in vapour. I have from Cornwall incrustations of true Stalactite, form'd in the pipes of fire engines in the mines, at heighths to which the water never ascends, by many feet; but only vapour.

Mundick is also thus a creature of the air, in many places. I have trigonal pyramids of Spar, which hung from the top of the Bauman's Cave, in the Hartz, covered with Cubic Mundick; there is none in the Spar itself; and from the particular circumstances of the specimen, water could not have lodg'd upon it, only vapour.

Spar is one thing, of one weight, one hardness, and when pure can never be mistaken for any other Fossil. It is liable to have other bodies mixt with it; and to be altered in its condition by that mixture: but 'tis itself the same. Wallerius distinguishes three degrees of hardness in this Fossil; but they are owing to those mixtures; the least hard is the true condition of Spar; the other degrees arise from iron, or other additions.

It is the opinion of Linnæus, that Spar owes its angulated form to Sea Salt; and the Cryftals to other Salts: but there is no warrant in nature for this judgement. Salts are acrid, and diffolve in water. These Foffils have neither of those qualities: and who shall tell us that the property of forming itself into regularly angulated Figures is peculiar to Salts? We have no authority to believe it is wanting in Crystal, and Spar; and we have the evidence of our senses that they have it.

The ingenious and ingenuous Croustedt well observes, these Figures ought not to be ascribed to Salts, till the presence of such Salts can be prov'd in them.

The calcarious nature of Spar is of its essence; and no form, nor all the other characters in the world, could constitute a thing a Spar, that wanted this. They all ferment with Acids, and they burn to Lime: nor is this latter quality equivocal, as some would think, because by the fire of a great burning glass, Spar vitrifies. This is not the fire, when we speak of Lime; and it can be a test of nothing; because all things vitrify before it: that is the extream force of fire: and the ultimate effect of fire on all bodies is vitrification.

Linnæus says, the Spar he calls Natro-spatosum, scarce does effervesce with Acids: and it may be added, that the particles of that Spar are scarcely at all Rhombic: Spar and Crystal are mixt in those bodies; and

and they have mixt qualities ; but still as there is some Spar, there is some Effervescence.

'Tis vain to give the forms of Spar to Natrum; for we not only find no Natrum there, but different Spars have forms of different Salts; and the great patron of the Salt System allows, that some of them affect the various angulated Figures of Alum, Sea Salt, Vitriol, and the rest. 'Tis true, they resemble those forms; but they have not those forms exactly: nor is either of these, or any other Salt whatever, to be found existing in any of them.

But whither will not the wind of Theory blow even the steadiest judgements: the foremost of the writers, who favour this System, because there are in Spars certain forms that do not agree with those of any known Salt, fancies for the formation of these that there exist Salts, not otherwise known to us, but by this operation. When Theory can reach this heighth, it may do what it pleases: to create Causes, because we see Effects that seem to us to require them, is to make all things easy; and at the cheapest rate.

If we can ever bring Spar, after solution, to recrystallize, as Salt; we shall see all things explained in this particular. 'Tis what I have try'd four years, with poor success; and I have now requested the ablest chymist that we have, to join with me in the attempt. What may arise under his experienced hand, I know not: all I have found is, that the swifter the fluid is evaporated,

porated, the coarser is the matter left behind; and the more length of time is given, the nearer it approaches to a promise of Crystals.

I think when this shall be accomplish'd, we shall find all Spar to be but one thing; differing only according to the other matters mixed with it. 'Tis said, the Selenite powder'd and mixt in water, affords Crystals; and Kahler gives the authority of an eminent metallurgist for it: with me neither has this succeeded yet: but I have no despair; and tho' it never should succeed with me, it may with others: when that is seen, the other, more important as it is, need not be supposed impossible.

Nothing is more familiar than the production of what it is the custom to call, Selenitical Salts; Urine affords them; and some preparations of Sulphur; but to recrystallize Selenite is, to produce, from a clear fluid, pellucid dodecahedral Rhombs, flexile, not elastic, and not soluble again in water: and he who shall effect this, need not despair of recrystallizing also Spar.

The Salts in Urine that has stood long come nearer the nature of Fossils than any thing we know; and Tartar, form'd from Wine, is very difficult of solution: yet both these may be melted in pure water. The Salt produced by slow crystalization from a Lixivium of Lime and Sulphur, comes nearest of all to Spar; but still it is but an approach; and not a sameness;

ness : as he who is well acquainted with all the qualities of the vitriolated Tartar will perceive, nor do I conceive Henkel's receipt, form'd on the same foundation, would go any farther : but till men speak plain, 'tis vain to war against their buried meaning.

In fine the formation of Spar is yet a subject of enquiry : its atoms are all Spar ; each particle into which we can without violence divide it, is the same in all respects as the whole : and as the Fossil world admits no generation, or birth, by egg, or seed, it seems most probable that all the variety of forms in which we see this Protean Mineral, are owing to no cause beside the arrangement of Rhombs into as many forms as they are capable of producing. It fills the cracks of its own rocks : and of no other : for Crystal Columns rise from crystalline Rocks ; and from Metallic Masses, fractur'd, grow Pyritæ ; each separated from the great mixt body we see split ; and each form'd into Figures by its own laws, without the intervention of Salt, or other matter.

We find hollow Crystals, and we have hollow Pyramids of Spar ; but 'tis a rash thought, tho' of a great man, to imagine that a Crystal of Salt was first form'd in these cases ; and when the stony coat was finished over, it melted away again : this is imagination : but there is not a hollow Stalactite that may not shew the senses, and convince the reason, that this shell of Spar, or Crystal, may be form'd without a solid nucleus.

There

There are no entire Rocks of Spar; and they who thought they had seen such of Crystal, perhaps mistook pure Ice for them. Both Spar and Crystal rise in general from fowl Stones; and they who thought Ice grew to them in time, were scarce more pardonable than such as took Ice for them. Scheukzer has seen the difficulty of accounting for their forms, and joined the lamentation of Philosophers upon that subject; for the Salt System was not then in being; but the old Pliny has not only lamented this difficulty, but assigned its cause; and this a cause to overthrow that system utterly: it is, that tho' the Figures be all regular, they are not all alike; or all resolvable into the same laws.

'Tis an invidious office, and unpleasing, to dwell upon the errors of those who wrote before; but these are so receiv'd, and so establish'd, that there is no other way to truth.

Wallerius says, that Spar is composed of Rhombic and Pyramidal particles: and therefore breaks into both these forms. It is unwillingly I dissent in a few particulars, from an author with whom reason and observation command me to agree in a great many: but this is a doctrine which strikes at the root of all accurate knowledge in respect of this body.

By this account Spar would be two things, not one: its atoms would have two Figures; and we should lose the great distinction by which it is kept
separate

separate from all other bodies. I have examined this point with all possible attention; and find the pyramidal Figures of Spar, whether in greater or smaller pieces, to be a secondary form; composed always of Rhombs: but the Rhombic Figure never to have any form in its constituent parts beside its own. The Pyramids, great or small, separate into Rhombs; the Rhombs never into Pyramids. The true way of dividing Spar is, by an Acid, carefully manag'd; for the parts are always separated, before they are dissolved.

It is a singular and a just observation of the same author, that no pentagonal Spar has ever been found; tho' angles in most other numbers are frequent; but this is not to be attributed with him, to an imaginary Salt, Alcaline, and Muriatic; it rests upon a much more solid base: which is, that the particular Figure of the Rhombs of Spar, admit the constructing any other angulated form, only not pentagonal.

It has been said, that Island Crystal shines in the dark after it has been calcin'd in manner of the Bolonian Stone; but this is not particular to that Species: it is the quality of all Spar, as Spar; only there requires great nicety in the calcination: perhaps Selenite also has this power. Linnæus refers the Bolonian Stone to Spars: to me it has appear'd rather a Selenite; and of all bodies in nature, most of kin to that species of Selenite we call the Star, upon the waxen vein. I have therefore retain'd it in that place, till more of this scarce Fossil comes in my way for trial: if

it prove Spar, 'tis easily removed into that Class; and thus, and only thus, we can arrive at truth; after a thousand errors.

That the Hog Spar affords Flowers on sublimation, has been urged as a great proof of its containing Salts of some kind or other; known or unknown; but surely this property is more naturally resolved into another source. All Bitumens yield flowers on sublimation; and we have the testimony of our senses to the presence of a Bitumen in the Lapis Suillus: it stinks of it. Nay more, there is a smell of Sulphur in all Spar, when calcined: Henkel and Wallerius, as well as I, have found it; and if we could give way to any thought of secondary forms, in a Fossil whose construction appears perfectly homogeneous, and simple, my sense of it would be, not to seek them in imaginary Salts, but real Sulphur.

We see the way art imitates it best, is by the Crystals of a liquor in which Lime and Sulphur have been boil'd. Sulphur is thus disclosed on the calcining of Spar; and for the other ingredient, Lime, we cannot be at a loss; since it has been observed, no Spar is ever produced in cracks of any rocks, except those of Limestone: nay, and what may strengthen this opinion, the Lime of Spar is weaker than that of Limestone, which, a little Sulphur may cause. All this, is but conjecture; and is delivered as such, and no other; but yet it rests on the testimonies of the senses; not on the flights of the imagination: and it is by conjecture,

ture, in these dark and difficult researches, we must arrive at truth.

I claim no better authority for many of the particular observations here, than for this general one; they are indeed all founded on examination, and experiments, now made on the occasion; but they are examinations and experiments made only on the bodies in my own scanty store: I invite, I solicit, and entreat with my best earnestness, others to repeat them on their own. If they answer as in mine, the doctrines are establish'd; if they differ, there is no one in the world to whom that truth will be more welcome than to myself. To equivocate about an error, is pitiful; to attempt to justify it, is disingenuous: no man should be ashamed of setting right his own mistakes (especially in matters where mistakes are unavoidable) whether by his own or others observation. With how many hundred errors did the *Species Plantarum* make its first appearance; how many of them have been rectify'd; and how many yet remain to be set right? Yet no one ever blamed Linnæus for his first conjectures; nor has the world seen any other book of Science of equal value.

Such errors are the children of imperfect information; and must be found in all who attempt to write for general utility.

Let others therefore freely repeat these my experiments, and add more of their own; and with
an

an honest freedom tell the result of all. My single attention can only make a few experiments, where true knowledge demands a thousand: but the result of different trials will bring forth truth.

It never was more needed in Philosophy than in the part before us; for with all the plausibility of system, we cannot but perceive upon this free and fair enquiry, that the Student in Fossils has yet to work upon a chaos: and that the paths into a better light, are stop'd and clos'd up utterly: not by ignorance; but what is much worse, by authenticated error; authenticated even by greatest names. We must unwind this Charm, if ever we hope to gain the right clue to lead us thro' the labyrinth of nature: we must break the fated Talisman; and all the seemingly impregnable structures will vanish: the ground will be clear before us; and if we lose ourselves in the open way, 'tis easy to be set right again.

SPAR form'd by nature, as above related, may either concrete in its pure state as soon as made; or it may pass while yet fluid, thro' various strata of Earthy, Saline, Mineral, and other matter, and receive great changes both in form and colour from them: it may appear to us therefore, according to these circumstances, either

- in its own pure state of a colourless Rhomb;
- or foul'd by earths; or ting'd by metals;
- or plated, by an admixture of Talc;
- or render'd cubic by the natrane Marle; and those cubes stain'd to a mimicry of Gems by metals;

or it may be shap'd into Polygons by an aluminous earth ;

or thrown into Pyramids, with or without Columns, by the Salts of Mineral Waters :

Or from the mere nature of its concretion, it may appear as curtains spread upon a wall ;

as Icicles hanging from a roof ;

or Globules drop'd upon the floor ;

or as a coat upon mosses, or shells, or various other matters.

According to these accidents it may be thrown into a kind of method, under the terms Genus and Species, to great advantage. The obvious Characters giving an artificial method ; and the consideration of their Origin a natural one.

S P A R.

O R D E R I.

Retaining its natural Figure.

G E N U S I.

P U R E S P A R.

R H O M B I T E S.

Spar in form of Rhombs.

This is either pure as it concretes alone ; or variously stain'd and colour'd by admixtures.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USE.
1. SOFT SPAR.							
Small Rhombs	tender	very heavy	glossy	COLOUR- LESS.	soft	Hartz forest	Rhombs Pellicida. N. a delicate, but weak lime.
2. ICELAND SPAR.							
Large Rhombs	friable	heavy	glossy	COLOUR- LESS.	smooth	Iceland, Switzer- land, &c.	Spatum Speculare Duplicans. L. double refraction.
3. MILKY SPAR.							
Irregular Rhombs	brittle	very heavy	dull	MILKY WHITE	rough	Derbyshire	Spatum Compactum. L. lime.
4. TOPAZ SPAR.							
Connected Rhombs	hard	very heavy	crystalline	PALE YELLOW	fatty	Germany	Spatum Speculare Flavescens. L. false gem.

5. GARNET SPAR.		Spatum Rubrum Compactum. L.	
Confus'd Rhomb	soft	heavy	dull
			STRONG RED.
		uneven	Yorkshire
6. EMERALD SPAR.		Spatum Speculare Virescent.	
Small Rhomb	hard	heavy	bright
			GREEN
		soft to the touch	Germany
7. SAPPHIRE SPAR.		Spatum Speculare Cerulefcent. L.	
United Rhomb	very hard	heavy	perfectly polished
			PALE BLUE
		dry	Germany
8. OPALINE SPAR.		Rhombites Opalina. N.	
Connected Rhomb	brittle	very heavy	clouded
			CHANGE- ABLE GREY
		soft	Brazils
9. YELLOW RHOMBIC SPAR.		Spatum Compactum Flavescent. L.	
Rude masses breaking in Rhomb.	friable	heavy	scaly
			DULL YELLOW
		glimmer- ing.	Norway, England
			lime.

S P A R.

ORDER II.

Affecting the Figure of Talc.

G E N U S I.

P L A T E D S P A R.

P A R O P S I S.

Spar formed into broad, flat Flakes.

Spar assumes this Figure after passing thro' beds of Talc.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
1. CLEAR FLAKY SPAR.							
Irregular, large flakes	brittle	light	glossy	COLOUR- LESS	unequal	Norway	for windows. Spatum Fissile. L.
2. WHITE FLAKY SPAR.							
Uneven cakes	very brittle	heavy	rough	MILKY	harsh	Sweden	lime. Spatum Aqueum Hartenf. W.
3. WAVY SPAR.							
Flat cakes	brittle	light	undulated	GREY	fatty	Denmark	lime. Spatum Undatum. L.

S P A R.

ORDER III.

Affecting the Figures of the Crystals.

F L U O R E S.

G E N U S I.

T W O - P O I N T E D S P A R.

FLUOR BICUSPIDATUS.

Composed of two hexagonal Pyramids, with an intermediate hexagonal Column. [83]

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
L. SALBERG SPAR.							
Small	soft	very heavy	polish'd	COLOUR LESS	Bituminous	the Salberg hills in Asbestos	curiosity.
2. TAWNY SPAR.							
Large	hard	heavy	uneven	YELLOWISH	bituminous	the Swedish iron mines	curiosity.

Floor Eicuspidatus
Diaphanus.
W.

Floor Eicuspidatus
Martialis.

Sberg of P **A** R.

ORDER III.

GENUS II.

CONNECTED SPAR.

FLUOR CONNEXUS.

Composed of two trigonal Pyramids, without any intermediate Columns.

L 2

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USE S.
I. DIAMOND SPAR.							
Small	hard	very heavy	polish'd	PERFECTLY CLEAR	smooth	Ramel- berg	curiosity.
							Dent des Cochons à deux Pointes. W.

S P A R.

ORDER III.

GENUS III.

COLLUMNAR SPAR.

FLUOR COLUMNARIS.

Composed of a Column, terminated by a Pyramid.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. HEXAGONAL SPAR.							
Long sprigs	tender	heavy	glossy	WHITISH	flaky	Derbyshire	curiosity.
2. TETRAGONAL SPAR.							
Thick sprigs	hard	very heavy	flaky	YELLOWISH	rough	Yorkshire, lead mines	lime.
3. TRIGONAL SPAR.							
Short sprigs	soft	heavy	scaly	RUDDY	uneven	forest of Dean	an iron ore.

Spatum Crystallinum
Hexangulare.
W.

Fluor Columbaria
Tetragonut.
N.

Fluor Columbaria
Trigonut.

SPAR.

ORDER III.

GENUS IV. PRISMATIC SPAR.

FLUOR PRISMATICUS.

In form of an angulated Column, without a Pyramid.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
1. SIX-SIDED SPAR.							
Coarse shoots	tender	heavy	rugged	BROWNISH	friable	Lancashire	Spatum Prismaticum Hexangulare, W. lime.
2. ABRUPT SPAR.							
Amass of short pieces.	hard	very heavy	smooth	RUDDY	confus'd together	Sweden	• Spatum Prismaticum Truncatum, W. lime.
3. MANY-SIDED SPAR.							
Short sprigs of fourteen fides	very hard	heavy	glossy	YELLOWISH	uneven	Derbyshire, lead mines	Spatum Crystallinum Tetradeca hedrum, W. lime.

• Wallerius saw this six sided : all my pieces are very ill determin'd in this article, breaking ill from the mass.

S P A R.

ORDER III.

GENUS V.

PYRAMIDAL SPAR.

FLUOR PYRAMIDALIS.

In form of Pyramids, without any Column •.

- These are usually found in great clusters in the cliffs of Rocks of Limestone.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. POLYGONAL SPAR *.							
A broad base and fourteen sides	hard	heavy	polish'd	YELLOWISH	in great clusters	Cornwall	Fluor Pyramidalis Polygonus. a flux for ores.
2. ELEVEN EDG'D SPAR.							
Short	tender	very heavy	glossy	RUDDY	cluster'd	iron mines in the Hartz	Spatum Pyramidale Endeca-hedrum. W. an iron ore.
3. EIGHT SIDED SPAR.							
Irregular masses	very hard	heavy	polish'd in some parts	YELLOWISH	clustery	lead mines, Derbyshire	Spatum Pyramidale Octa-hedrum. W. lime.

* This seems the other half of the preceding Species, but always separate.

SPARR.



ORDER III.

GENUS VI.

OBLIQUE SPAR.

SUILLUS.

In form of cluster'd Prisms, cut off obliquely at the top.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. BROWN OBLIQUE SPAR.							
Uneven clusters	tender	heavy	polished	DARK BROWN	stinking when rub'd	Germany, and Norway	Lapis Suillus Prismaticus. W. a flux for ores.
2. RADIATED OBLIQUE SPAR.							
Uneven masses	soft	heavy	unequal	GREY	very stinking	Denmark	Lapis Suillus Radiatus. W. curiosity.
3. GLOBULAR OBLIQUE SPAR.							
Rounded masses	hard	heavy	botryoide	BRIGHT BROWN.	fulphure- ous when struck	Norway	Lapis Suillus Sphericus. W. lime.

The Colour, as well as scent of these Spars, goes off in the fire: they require but a slight heat to render them as white and sweet as the other Spars: nor is it wonderful that sulphur should predominate so much in one kind, more than others. But 'tis singular, that the form of these Species is their own, and is indeed a certain Generic character; and that the abundant sulphur always attends it.

SPAR.



ORDER · IV.

CUBIC.

DRUSÆ.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. CLEAR CUBIC SPAR.							
In great complex clusters	soft	heavy	polished	COLOUR- LESS	multi- tudes mix'd to- gether rudely	Derbyshire	lime. Spatum Crystallizatum Cubicum. W.
2. BROWN CUBIC SPAR.							
In thick clusters	hard	heavy	smooth	YELLOWISH BROWN	confus'd in clusters	Cornwall	a flux for ores. Drofa Fusca.
3. PURE WHITE CUBIC SPAR.							
Small and distinct	soft	very heavy	glossy	PERFECTLY WHITE	loose and free	Gloucester- shire, in iron mines	curiosity. Drofa Lactea.
4. GREY CUBIC SPAR.							
Small clusters	hard	heavy	scaly	GREY	connect- ed, but not confus'd	Germany, in iron rocks	a flux. Drofa Grisea.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
5. TAWNY CUBIC SPAR.							
In great confus'd masses	brittle	very heavy	rugged	YELLOWISH BROWN.	confus'd clusters	Forest of Dean	a flux.
6. PURPLE CUBIC SPAR.							
Small, and single	very hard	heavy	polish'd	AMETHYSTINE	distinct and perfect	Norway	curiosity.
7. RED CUBIC SPAR.							
Separate cubes	hard	very heavy	glossy	FINE RED	pure and free	Spain	a gem.
8. BLUE CUBIC SPAR.							
Loose clusters	tender	very heavy	polish'd	BRIGHT BLUE	connected, not confus'd	North America, in copper mines	a false gem.

Druſa Fulva.

Druſa Amethyſtina.

Druſa Rubefcens.

Druſa Cerulea.

Looke clusters	tender	very heavy	polish'd	BRIGHT BLUE	ed, not confus'd	in copper mines	a false gem.
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[95]

9. DEEP-GREEN CUBIC SPAR.

Small
clusters

soft

heavy

scaly

DEEP
GREEN

small
masses

Sweden

a flux.

Drufa
Viridis.

10. PURPLE CUBIC SPAR.

Distinct

soft

heavy

flaky

DEEP
PURPLE

single

Germany

a flux.

Drufa
Violacea.

11. AQUA MARINE CUBIC SPAR.

Small
clusters

tender

heavy

glossy

BLUE
GREEN

distinct,
tho' con-
nected

Hartzforest

a flux for ores.

Drufa
Carulco Virens.

12. EMERALD CUBIC SPAR.

Large
clusters

hard

very
heavy

polished

PERFECT
FINE GREEN

connected

Norberg

a flux for metals.

Drufa
Smaragdina.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
13. LEMON CUBIC SPAR.							
Vast masses	very soft	heavy	scaly	PALE, BUT DEAD YELLOW	confused	the Hartz	Drufa Pallefcens. a flux for ores.
14. VIOLET CUBIC SPAR.							
Distinct, and small	hard	heavy	polished	VIOLET COLOUR'D	scarce connected	Gilsoff	Drufa Violacea, a false gem.
15. BLACK CUBIC SPAR.							
In large clusters	very hard	very heavy	glossy	BLACK	connect- ed, not confused	France, where there is TIN	Drufa Nigra, curiosity.
16. DEEP-GREY CUBIC SPAR.							
Small clusters	soft	heavy	polished	DEEP GREY	confused	Cornwall	Drufa Griseofulca. a flux.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USE S.
17. BLUE- GREY CUBIC SPAR.							
Small clusters	hard	very heavy	glossy, but flaky	BLUE GREY	connected	Sandswaer, in Norway	a flux. Druse. Subcrulea.
18. GARNET CUBIC SPAR.							
Loose and free	soft	heavy	polished	FINE RED	scarce connected	Alface	a false gem. Druse. Rufa.
19. RUBY CUBIC SPAR.							
Small clusters	hard	very heavy	glossy	BRIGHT RED	almost free	Schemnitz	a false gem. Druse. Rubea.

SPAR.



ORDER V.

ANDRODAMANDE SPAR.

ANDRODAMAS.

Oblong, and affecting the parallelloiped Figure.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. WHITE ANDRODAMANDE.							
In large masses	very soft	heavy	polish'd	CHALKY	brittle	Sneeberg	lime.
2. YELLOW ANDRODAMANDE.							
Vast masses	tender	heavy	flaky	DULL YELLOW	shattery	America	lime.
3. TAWNY ANDRODAMANDE.							
Great masses	soft	very heavy	glossy	BROWNISH YELLOW	brittle	Anderasberg, in Germany	a good flux.

Androdamae
Alba.Spatum Pelucidum
Flavescens.
W.Spatum Pelucidum
Croceum.
W.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
4. BLACK ANDRODAMANDE.							
Small clusters	hard	very heavy	glossy	DEEP BLACK	brittle	Coffelae, in Saxony	a tin ore. Spatum Pellocidum Nigricans. W.
5. GREEN ANDRODAMANDE.							
Small clusters	soft	heavy	polished	FINE GREEN	brittle	Switzerland	Androdamas Smaragdinus Scheukz. a false gem.
6. MARBLED ANDRODAMANDE.							
Great masses	hard	very heavy	veiny	YELLOW, VEIN'D WITH RED AND BROWN	brittle	Switzerland	Spatum Pellocidum Venosum. W. lime.

S P A R.

O R D E R VI.

I R R E G U L A R S P A R S.

S P A T U M E F F L O R E S C E N S.

Uncertain in its Angles, but throwing itself into complex elegant Forms.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. ROSE SPAR.							
Large rose-like masses	tender	heavy	flaky	DEAD WHITE	hollow	Sweden, in lead mines	Spath Crystallise en Roſe. W. a flux.
2. HEDGE HOG SPAR.							
Small masses	hard	light	unequal	GREYISH	convex	Italy	Spath Echinorum Imperati. curioſity.
3. LAMELLATE SPAR.							
In vaſt flattened masses	hard	heavy	gill'd like mushroom rooms	WHITE	lightly convex	Germany	Spatum Plexum Tetradecahedrum. W. lime.
4. BROKEN SPAR.							
Great lumps	very hard	heavy	ſmooth	BROWNISH	form'd of half octagons	Sweden	Spatum Dimidiatum. W. a flux.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
5. DECUMBENT GRAPE SPAR.							
Large clusters	soft	heavy	glossy, but rising in lumps	PALE BROWN	brittle	Sax Weiffenfels, in Norway	lime. Spatum Botryticum. W.
6. CYLINDRIC SPAR.							
Great masses	soft	very heavy	glossy	PALE YELLOWISH	brittle	Bispsberg, in Sweden	lime. Spatum Crystallinum Cylindricum. W.
7. GLOBULAR SPAR.							
Round lumps	hard	heavy	smooth	BROWNISH	firm	Hartz forest	lime. Spatum Crystallinum Globosum. W.

SPAR.

ORDER VII. DEBASED SPAR.

SPATHURA.

Alter'd in its aspect and qualities by a mixture of other matters.

GENUS I.

SAND SPAR.

SPATHURA ARENACEA.

Granulated irregularly, and having an aspect of lumps of Sand.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. WHITE SAND SPAR.							
Rude masses	brittle.	heavy	uneven, and irregular	GREYISH WHITE	composed of various siz'd, particles	Twyebrook, in Sweden	Spatum Arenaceum Album. W. a flux.
2. YELLOW SAND SPAR.							
Small clumps	shattery	heavy	uneven	BROWNISH, YELLOW, AND GREY	confused, and coarse	Germany	Spatum Arenaceum Cinereum. W. a flux.
3. RUDDY SAND SPAR.							
Rough lumps	very hard	very heavy	uneven, and rough	DEEP RED	irregularly mixed	Forest of Dean	Spatum Arenaceum Rubrum. W. a flux.

S P A R.

ORDER VI.

GENUS II.

GLASS SPAR.

SPATHURAVITREA.

Glassy, firm, solid, and shapeless.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. CLEAR GLASS SPAR.							
Large nodules	very hard	heavy	uneven, but glossy	COLOUR-LESS	breaking into rude cubes	Stalberg	curiosity.
2. GREY GLASS SPAR.							
Rude Lumps	very hard	heavy	polish'd, but uneven	GREYISH WHITE	breaks in angulated fragments.	Hartz forest	curiosity.

Spatum
Scintillans.
L.

Spatum Listeribus
Nudis.
W.

S P A R.

ORDER VI.

GENUS III.

PYRITIC SPAR.

SPATHURA PYRIMICHA.

Irregular, botryoide, and striated.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
I. RUDDY PYRITIC SPAR.							
Oblong lumps	brittle	very heavy	raised in bumps	RUDDY BROWN	sulphureous, when broken	Forest of Dean	Spatum Pyrimachum Rubrum. W. curiosity.

All the debased Spars have more or less of various mixtures in them, and therefore manifest their characters as Spar, less freely; but there is always more or less of the calcarious quality in them; and when broken, if not while whole, they shew somewhat of the cubic form in their particles.

S P A R.

ORDER VII.

CURTAIN'D SPAR.

STIRIA.

Hanging over the walls of caverns in form of folded curtains.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. PURE CURTAIN'D SPAR.							
Vast sheets	brittle	heavy	polished, and glittering	COLOUR- LESS	flaky, when broken	Grotto of Antiparos	for slabs and or- naments.
2. YELLOW CURTAIN'D SPAR. ORIENTAL ALABASTER.							
Wav'd sheets	tender	heavy	polished, and undulated	PALE YELLOW, VARIOUSLY VEIN'D	breaks in freaky flakes	Ægypt; also Cornwall	for ornaments.

Stiria
Decolor.

Stiria
Flavescens.

Stiria
Amethystina.

3. PURPLE CURTAIN'D SPAR.
ROOT OF AMETHYST.

4

Thick coats

hard

heavy

uneven,
but
glossy

GREY,
BLOTCH'D
WITH PUR-
PLE, OR
OTHER
COLOURS

breaks
unevenly,
and
crackly

Derbyshire

for ornaments.

4. WATER SPAR.

In crusts in
tea-kettles

brittle

light

uneven,
and
rough

DIRTY
GREY

striated

every where

none.

Stiria
Fulca.

5. AERIAL SPAR.

Fine coats

hard

heavy

smooth,
and
even

BROWNISH
YELLOW

striated,
when
broken

in the pipes
of fire en-
gines in the
Cornish
mines where
only vapour
comes

curiosity.

Stiria
Acria.

SPAR.



ORDER VIII.

STALACTITIC SPAR.

STALACTITES.

In form of Icicles hanging from the roofs of caverns.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. WHITE STALACTITE.							
Long cones	brittle	heavy	uneven, but polished	WHITISH	flaky, when broken	roofs of caverns, Antiparos, and Derbyshire	Stalactites Albus. an ornament for grottos.
2. GREY STALACTITE.							
Thick cones	hard	heavy	rumpled, and uneven	GREYISH	shattery	limestone caverns, Derbyshire	Stalactites Griseus, W. for grotto work.
3. CHALKY STALACTITE.							
Coarse cones	soft	light	wav'd, and rumpled	PURE WHITE	dusty, when broken	vaults and arches, Windsor, &c.	Stalactites Cretaceus. for grottos.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
4. RED STALACTITE.							
Short cones	brittle	very heavy	wav'd	RED	irregular, when broken	Derbyshire	Stalactites Ruber. W. none.
5. BLACK STALACTITE.							
Slender cones	very hard	heavy	rumpled	DEEP BLACK	flaky, when broken	Grapenberg, in Sweden	Stalactites Niger. W. for grottos.
6. FOLIACEOUS STALACTITE.							
Thick cones	soft	heavy	uneven, and as it were leafy	YELLOWISH	thin flakes, broken	Hartzforest	Stalactites Feuillette. W. for grottos.

S P A R.

ORDER IX.

STALAGMITIC SPAR.

STALAGMITES.

Form'd into globular Figures, coated as an Onion.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
1. SUGAR-PLUM STALAGMITE.							
Small, round lumps	soft	heavy	scaly	PURE WHITE	thin coated	Italy	curiosity.
2. GREY STALAGMITE.							
Round lumps	hard	heavy	bubbled	BROWNISH GREY	thick coated	Sweden	lime.
3. OVAL STALAGMITE.							
Small, oval lumps	tender	heavy	smooth	YELLOWISH	crackly	Zweybreck, in Sweden	lime.

Stalagnites
Orobias.
W.Pifolithus.
W.Orobias
Scheuk.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
4. FISH-SPAWN STALAGMITE.							
Great stony masses, of lit- tle oval lumps	soft	light	smooth	WHITISH	tender	Ketton, in Rutland	Meconites Scheuk. a building stone.
5. SAND STALAGMITE.							
Stony masses of small grains	hard	heavy	rugged	REDDISH	shattery	Cornwall	Ammites, B. a flux.
6. BLACK STALAGMITE.							
Small masses	very hard	heavy	scaly	DEEP BLACK	thin coated	Nerike, in Sweden	Cecharites Niger Scheuk. a flux.

SPAR.

ORDER X.

INCRUSTING SPAR.

INCRUSTATIO.

Forming a stony coat upon mofs, or shells, or other substances.

Forming a stony coat upon moss, or shells, or other substances.

[119]

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. BROWN INCRUSTING SPAR.							
A thin coat	very soft	light	rugged	PALE BROWN	brittle	Yorkshire, in waters	curiosity. Incrustatio Fusca.
2. GREY INCRUSTING SPAR.							
A thick coat	hard	heavy	wavy	GREYISH	firm	Sweden, on shells	curiosity. Incrustatio Albida.
3. RUDDY INCRUSTING SPAR.							
Rude coats	tender	very heavy	uneven	REDDISH	brittle	forest of Dean	curiosity. Incrustatio Rubescens.

THESE, so far as I have yet seen, are all the Species of Spar: but so many there are; and thus they may be arranged in a cabinet. They are more than is usually thought: but the eye shews them; and their existence cannot be disputed.

If the term Species be question'd, and it be said, that many here called such, are only Varieties; I cannot agree to that term as a subdistinction, tho' many, and great names support it. I should be sorry, any of those Authors entered into a dispute about it; for I should be obliged to tell them, that there is no real distinction of Species in Spar. Spar is but one body, and all its appearances are Varieties: however, the numbering them as Species, fixes their names; and ascertains the account, without the confusion of a useless subdistinction.

Heavy watery Vapour

Mineral Acid—Acidulated Water

Bitumen

Sulphur

Limestone

S P A R.

Limestone

Sulphur

Bitumen

Acidulated Water—Mineral Acid

Heavy watery Vapour

NATURAL METHOD of S P A R S.

The ORIGINATION of their FORMS and COLOURS,

according to the Course they have run before Concretion.

running thro'		and this thro'		This running		running thro'	
3 ^b Saline deep-lodged Earths	4 ^b Natrane Pure	becomes Spatum Crifallia- tum Cubicum. W.	Ferrum Tefillare becomes Plumbum Compactum Bismuthum — Molybdena Plumbago Argentum Album Ferrum Hepaticum Aurum Marcafficum Argentum Rubrum Androdamas Alba.	Rhombites Pellucida By flower Con- cretion Spatum Spec- ulare Du- plicans	1 ^a Earths, fimple and fuperficial	2 ^a Ores	3 ^a Saline deep-lodged Earths
			Gypfum Opacum Lapis Hepaticus Selenites Flavus Hepaticus Niger Gypfum Virens Selenites Virficolor		Chalky Yellow Ochreous Red Ochreous Armenus Malachitis Fahlertziana Galena Virens Compactum	1 ^a of Copper 1 ^a of Lead 1 ^a of Antimony 1 ^a of Tin	
5. Sand Stone		Creta Rara Gubr Cinereum Ferrum Commune Cryftallinus Pyrites Figuratus Nativus Talcum Aureum Ollaris Talcum Albicans	Spatum Arenaceum Album. W. Spatum Arenaceum Cinereum. W. Spatum Arenaceum Rubrum. W. Lapis Suillus Prifmaticus. W. Lapis Suillus Radiatus. W. Lapis Suillus Sphericus. W. Spatum Undatum. L. Spatum Aqueum Harenfe. W. Spatum Fiffile. L.		Calx Nativa Ferrum Spatofum Lithomarga Calaminaris Ferruginea Pyrites Ferri Auripigmentum Pyrites Cupri Ferrum Arenofum Plumbum Galena Sorbium Striatum Plumbum Spatofum the Brown Drufa Fulca the White Drufa Lactea	1 ^a Viriolic 1 ^a Aluminous 1 ^a Muriatic	
6. Sulphurs							
7. Talc							
8. Cos Quadratum	Spatum Lateribus Nitidis. W.	Quartzum Lactecum Quartzum Fiffile Quartzum Opacum Spatum Botryticum. W.	Spatum Cryftallifum Globofum. W. Spatum Cryftallifatum Cylindricum. W.		1 ^a Viriolic 1 ^a Aluminous 1 ^a Muriatic	1 ^a of Lead 1 ^a of Antimony 1 ^a of Tin	
9. Cryftal Beds	Spatum Scintillans. L. Argilla Pallida	Marga Cretacea Leucargilla Cinerea. W. Argilla Fulca Argilla Pallida	Spatum Dimidiatum. W. Spatum Plexum Terradecahedrum. W. Spatum Echinatorum Imperati. Spath Cryftallife en Kofes. W.		1 ^a Viriolic 1 ^a Aluminous 1 ^a Muriatic	1 ^a of Copper 1 ^a of Lead 1 ^a of Antimony 1 ^a of Tin	
With a flow Courfe, after long Relt, thro'		15. Earths	Humus Rubra. W. Creta Molilis Humus Atra L. Calcareus Niger. W. L. Calcareus Albus. W. L. Calcareus Grifeus. W. L. Calcareus Undulatus. W. L. Calcareus Stratofus L. Calcareus Fulcus	Incruffatio Rubefcens. Incruffatio Albida. Incruffatio Fulca. Cenchrites Niger. Schenk. Ammites. B. Meconites. Schenk. Orobias Schenk. Pifolithus. W. Stalagmites Orobias. W.	10. Alabafter	11. Marble	12. Lime 13. Chalk 14. Or raifed by Heat in Vapour
		16. Calcareous Stones			Alabafter Alabafterum Durum. W. Alabafterum Maculis Nigris Alabafterum Oychites Alabafterum Candidum Pierre à Chaux Blanc Marbre Rouge Marbre Jaune. W. Marbre Blanc	the Grey Drufa Grifea the Pure Spatum Cryftallifatum Cubicum. W.	the Grey Drufa Grifea the Pure Spatum Cryftallifatum Cubicum. W.
					Ferrum Calcareum Cuprum Sclitofum Cuprum Nickelum Cuprum Lazuli Cuprum Cotaceum Plumbum Spatofum Plumbum Virens	Ferrum Calcareum Cuprum Sclitofum Cuprum Nickelum Cuprum Lazuli Cuprum Cotaceum Plumbum Spatofum Plumbum Virens	Drufa Fulva. Drufa Amethyftina. Drufa Cereulea. Drufa Viridis. Drufa Cereuleo-virens. Drufa Smaragdina.
					Stalactites Feuillette. W. Stalactites Niger. W. Stalactites Ruber. W. Stalactites Cretaceus. Stiria Fulca. Stiria Amethyftina. Stiria Flavescens. Stiria Decolor. Stalactites Grifeus. W. Stalactites Albus. Stiria Actia.	Stalactites Feuillette. W. Stalactites Niger. W. Stalactites Ruber. W. Stalactites Cretaceus. Stiria Fulca. Stiria Amethyftina. Stiria Flavescens. Stiria Decolor. Stalactites Grifeus. W. Stalactites Albus. Stiria Actia.	

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NATIVE FOSSILS.

CLASS IV.

CRYSTAL.

CRYSTALLUS.

A pure Fossil, bright, glassy, not fissile, nor breaking into regular forms.

IT has been said that Crystals break into Columns, as Spar breaks into Rhombs; but 'tis not so: the trial is easy; and will contradict the assertion; Spar is formed of connected Rhombs; Crystal is as a mass of melted glass.

Like Spar, or Selenite, it is one thing; what are called Species, are varieties; and these varieties arise from accidents, and are not in the nature of the body.

The natural place of Crystal is in the clefts of rocks: but only of such rocks as have a crystalline matter for their base. No man ever saw Crystal in the fissure of a limestone rock, or Spar in a crystalline one.

It sometimes lines these cavities with a pure wall of seeming glass; sometimes even fills the fissure with one vast mass; and when rendered foul by great quantities of earth, it forms whole rocks, whole mountains.

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These splitting, water washes it pure again into the cracks; and thus is the eternal circle kept in being.

Pure Crystal that has connected slowly, is colourless, pellucid, and of an angulated form; a Prism, with a Pyramid at each end; this is its proper shape: but as it has been disturbed in its formation, or fouled with mixtures, it assumes variously angulated Figures; or forms masses not angular; and loses of its transparency, and gains new colours.

Under this variety of appearances, it is to be considered in the arrangement of a cabinet; and thus its forms are to be laid down here: those who please may call them Species; those who chuse may enter them as varieties, or dispute about the vanity of terms: here they are laid down only as so many numbered appearances of the one thing Crystal, and reckoned as no other. They will be best understood by distributing them into various Orders, according to their general marks of difference; and so much we allow: the rest is folly.

CRYSTALS.

ORDER I.

Of angulated Figures.

TRI BE I.

In form of a Prism of six sides, terminated by a Pyramid of six sides, at each end.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. PURE CRYSTAL*.							Crystal de Roche à deux Pointes. W.
Slender	very hard	heavy	bright, and polish'd	TRANSPARENT, AND COLOUR-LESS	pure	Bristol	glass.

* This differs in nothing from the form of pure Spar, but that the points are perfect and sharp here, never in the Spar.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
2. TOPAZ * CRYSTAL.							
Short	hard	very heavy	glossy	YELLOW	very pure	the Brazils, and Bohemia	Nitrum Lapidosum Flavum. L. a gem.
3. HYACINTHINE * CRYSTAL.							
Long, and slender	hard	heavy	polish'd	FLAME COLOUR'D	pure	Sweden	Nitrum Lapidosum Purpureolum. L. gem.
4. BERYLL CRYSTAL.							
Small	very hard	heavy	glossy	BLUE GREEN	watery	Germany	Nitrum Lapidosum Cyaneum. L. gem.

* These are called by some the occidental Gems, occidental Topaz, and the rest : but they are nothing but coloured Crystal ; the most perfect and finest of them keep the proper form of the Prism, with two Pyramids ; but as they have concentered hastily, or been mixt with less pure matter in concretion, they lose of their Figure, keeping sometimes only one of the Pyramids, or in some scarce any angulated form ; but still they are to be known by their brightness, and according to their colours.

5. SAPPHIRE CRYSTAL.			FINE BLUE	polished	bright	Bohemia	Nitrum Lapidosum Ceruleum. L. gem.
Thick	hard	heavy					
6. EMERALD CRYSTAL.			PURE GREEN	bright, and glossy	cloudy in parts	Switzerland	Nitrum Lapidosum Viride. L. gem.
Long	tender	heavy					
7. RUBY CRYSTAL.			FINE RED	lineated	perfectly pure	Peru	Nitrum Lapidosum Rubrum. L. gem.
Short and thick	very hard	heavy					
8. AMETHYSTINE CRYSTAL.			PURPLE	polished	cloudy in part	Bohemia	Nitrum Lapidosum Violaceum. L. gem.
Short and thick	tender	very heavy					

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
9. BROWN CRYSTAL.							
Thick	very hard	heavy	freaky	DULL BROWN	clear	Norway	Nitrum Lapidofum Nigricana, L. for seals.
10. WHITE CRYSTAL.							
Large	tender	lighter	smooth	WHITISH	cloudy	Gloucester- shire	glafs.
11. BLACK CRYSTAL.							
Small	very hard	heavy	glossy	PERFECTLY BLACK	opaque	Bristol	grottos, glafs Crystals Nigricans. Bom.

CRYSTALS.

ORDER I.

TRIBE II.

In form of a Prism of six sides, with a Pyramid at one end; and fixed to the Rock at the other.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
I. PURE SPRIG CRYSTAL.*							
Large	hard	heavy	glossy	COLOUR- LESS	perfectly pellucid	every where in rocks	Nitrum Lapidinum Oblongum. L. grottos.

* This is found coloured in all the dyes of the preceding. Those Specimens should be arranged under the pure, as in that Species; but they can have no new name; they are to be called Topaz Crystal, as the former. There must be but one name for them, and those; for they are but one thing in nature and in construction, tho' the forms differ.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
2. BROAD SPRIG CRYSTAL.							
Large	hard	very heavy	polished	WATERY	cloudy	Bristol	* Nitrum Quartzosum Lateribus duobus latioribus. L glafs.
3. NARROW SPRIG CRYSTAL.							
Small, and long	hard	very heavy	glossy	WHITISH	foul	Forest of Dean	glafs.
4. LONG SPRIG CRYSTAL.							
A small, long column	very hard	heavy	bright	COLOUR-LESS	perfectly pellucid	Switzerland	Cryſtallus Planis Intermediis Majoribus Steno. glafs.
5. SHORT SPRIG CRYSTAL.							
A thick, short column	hard	heavy	rudd	WHITISH	cloudy	Germany	Nitrum Lapidosum Subcaule. L glafs.

* Linnæus has been free in the use of the name, Nitre, for these Crystals; for by his plan they are kinds of Nitre. I love and honour him, but can't adopt this Salt System. I hate to contradict a Genius of so vast merit; but we must by that freedom, come at real knowledge. It is not Nitre Crystal most emulates in its form: 'tis the vitriolated Tartar that Crystal resembles; an artificial, not a natural Salt.

CRYSTALS.

TRIBE III.

In form of Pyramids, without a Column.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
1. CLEAR DOUBLE CRYSTAL. Two short pyramids, base to base	hard	heavy	glossy	COLOUR- LESS	pellucid	Sweden	Nitrum Lapidosum Acule. L. glass.
2. BROWN DOUBLE CRYSTAL. Two thick pyramids	hard	heavy	lineated	PALE BROWN	pellucid	Grenades	glass.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
3. LOW CRYSTAL. *							
A pyramid fixt to rock	very hard	heavy	bright, and glossy	COLOUR- LESS	pellucid	Bristol	grottos.

* Of this form also there are occidental Gems; they should be ranged under this, in a cabinet, as varieties of this variety, but they can have no other names than the first, because they are no other thing.

All these kinds of Crystal are best understood when we find them single, but they are most frequent in clusters; the single ought to be placed first in each kind, and the clustered to follow.

C R Y S T A L S.

TRIBE IV.

Angulated Crystals, fouled.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. COATED CRYSTAL.							
A covered column	hard	heavy	very rugged	RED OR GREEN	colourless when the coat is off	Cornwall	Nitrum Lapidofum Opacum. L. grottos.
2. WATER CRYSTAL.							
A column with a drop in it	hard	light	glossy	COLOUR-LESS	streaky	Germany	curiosity.
3. HOLLOW CRYSTAL.							
A column empty and hollow	hard	heavy	polished	WHITISH	watery	Switzerland	Nitrum Lapidofum Inane. L. curiosity.
4. TALCY CRYSTAL.							
A column	hard	heavy	glossy	COLOUR-LESS	with spangles of Talc within	Germany	curiosity.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
5. ASBESTINE CRYSTAL.							
A thick column	hard	heavy	lineated	PELLUCID	fibres of Asbestos within	Sweden	curiosity.
6. MARCASITE CRYSTAL.							
A column	hard	heavy	streaky	CLEAR	spangles of marcasite within	Germany	curiosity.
7. ANTIMONIATE CRYSTAL.*							
A coarse column	hard	heavy	rudd	WHITISH	with antimony ore in it	Sweden	curiosity.

* There may be more of these, and they should have their places after them. These are all I have seen : and 'twill be well if those who fancy others, will attend to Cronstedt's caution, and see they do not take Asbestos for grafs, and earth for mofs.

if those who fancy others, will attend to Cronstedt's Caution, and see they do not take liberties for g

C R Y S T A L S.

ORDER I.

TRI BE V.

S A N D S.

A R E N Æ.

Broken; irregularly angulated, and in form of powder.

I. P U R E S A N D S.

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FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. PURE CRYSTALLINE SAND.							
Large dust	hard	heavy	glossy	COLOUR- LESS	angulated	Perfia	Arena Mobilis a. L.
2. ROUND CRYSTALLINE SAND.							
Round granules	hard	heavy	rough	COLOUR- LESS	rounded	the Me- diterranean shores	Arena Mobilis b. L.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
3. VOLATILE SAND.							
Fine dust	soft	light	duffy	WHITISH	angulated	Arabia	Arena Mobilis γ L.
4. ORANGE SAND.							
Large grains	hard	heavy	rugged	ORANGE-COLOUR'D	coarse	Surinam	Arena Colorata α Lin.
5. WHITISH SAND.							
Rough particles	hard	heavy	rugged	WHITE	opaque	Hertford-shire	Arena Colorata β L.
6. PALE YELLOW SAND.							
Irregular grains	hard	heavy	rugged	PALE YELLOW	foul	every where	Arena Colorata γ L.

7. RED SAND.	Large grains	hard	heavy	smooth	DULL RED	clear	Shores of Red Sea	Arenaria Colorata L.
8. VIOLET SAND.	Large grains	hard	heavy	polished	PURPLE	bright	Shores of the Baltic	Arenaria Colorata L.
9. PALE SAND.	Great granules	hard	heavy	smooth	PALE YELLOWISH BROWN	rounded grains	Shores of rivers	Arenaria Lacustris L.
10. HILL SAND.	Irregular grains	hard	heavy	uneven	BROWNISH GREY	some rounded grains	high grounds and woods	Arenaria Campetris L.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
II. COATED SAND.							
Large grains	soft	heavy	coated with earthy shells	WHITE	rounded grains	Sweden	Arena Margaria. L.
12. HEATH SAND.							
Very small grains	soft	light	dusty	REDDISH GREY	rudely angulated	Heaths every where	Arena Glarga. L.
13. OCHREOUS SAND.							
Small grains	soft	light	rough	YELLOW	angulated	near ferrugi- nous springs	Arena Ochracea. L.
14. FLINTY SAND.							
Great particles	harsh	heavy	polished	HORN COLOUR'D	angulated	England	Arena Silicea. L.

2. MIX'D SANDS.

15. RUSTIC SAND.							<i>Arena</i> <i>Rufica,</i> L.
Rude parti- cles	harsh	light	rugged	BROWN, AND GREY	mix'd of broken stone, and sand	Suffex, Sweden	
16. RUGGED SAND.							<i>Arena</i> <i>Sabulum,</i> L.
Unequal particles	harsh	light	rough	BROWN, AND WHITE	of stone, sand, and talc	Sweden	
17. CASSERITE SAND.							<i>Arena</i> <i>Cassiterita,</i> L.
Fine parti- cles	soft	light	smooth	MILKY WHITE	spangles of glim- mer	Cassiterite Island	
18. YELLOW GLIMMER SAND.							<i>Arenas</i> <i>Micaeas</i> <i>Aureas.</i> L.
Small par- ticles	soft	light	glossy	GOLD YELLOW	of yellow mica, and sand	Sweden	

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
19. WHITE GLIMMER SAND. Small particles	soft	light	glossy	SILVERY WHITE	of white mica, and sand	Sweden, Germany	Arenha Micacea Argentea. L.
20. GOLD SAND. Uneven particles	harsh	heavy	shining	YELLOWISH	grains of pure gold	Africa, and East Indies	Arenha Aurea. L. for gold.
21. IRON SAND. Sharp particles	hard	heavy	glittering	BLACK	angulated and flattened particles	Italy, Sweden	Arenha Ferrug. L. for writing.
22. GRANITE SAND. Rude particles	harsh	heavy	shining	MIXT OF WHITE, RED, GREEN, &c.	of fragments of granites	Minorca, &c.	'Saburra [Granatica, H.

23. PORPHYRY SAND †.

Sabarra
Porphyria.
H.Unequal
parts

hard

heavy

smooth

MIXT OF
PURPLE,
WHITE, &c.composed
of frag-
ments of
porphyry

Ægypt

3. SHELLY SANDS.

24. EGYPTIAN HOUR-GLASS SAND †.

Arenæ
Ægyptiaca.
N.Unlike par-
ticles

soft

light

dull

BROWN,
AND
WHITEmix'd of
crystal,
talc, and
broken
shells

Ægypt

† These are formed of fragments of Granite, Porphyry, and other Stones, beaten to powder, one against another. They are not genuine Sands, and there may be as many kinds enumerated as there are Stones; but these in their genuine state, will have their place hereafter.

† This, and the three following, are now first known to me; the gift of my great patron. They are objects for the microscope, and of the very finest kind; they are full of minute, but perfect shells; many of them Species, not otherwise known.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
25. CHIOZAN SAND.							
Most unlike particles	harsh	light	shining	BLACK, WHITE, AND REDDISH	of crystal, iron, sand, jet, marca- site, and en- tire small shells	Italy	Arena Chiozana.
26. RIMINIAN SAND.							
Very large, unlike par- ticles	harsh	light	glittering	BLACK, AND WHITE	of crystal, iron, sand, jet, corals, and entire shells	Rimini	Arena Riminiana. N.
27. BONONIAN SAND.							
Foul par- ticles	soft	light	dull	YELLOWISH	of crystal, talc, clay, and small ammonitæ	Italy	Arena Ammonifera. N.

CRYSTALS.

ORDER II.

In masses not angulated.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. PEBBLE CRYSTAL.							
A round lump	hard	heavy	wavy	COLOUR- LESS	pellucid	Brasil, &c.	Quartzum Purum Cristifect. spectacles.
2. WHITE PEBBLE CRYSTAL.							
Round stones	hard	heavy	uneven	WHITISH	watery	Sweden	Quartzum Pingue Cristifect. glaſs.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
3. BLUE PEBBLE CRYSTAL.							
Small lumps	very hard	heavy	smooth	PALE BLUE	clear	Island of Uto	Quartzum Ceruleum Crassede. a false gem.
4. AMETHYSTINE PEBBLE CRYSTAL.							
Large lumps	hard	heavy	glossy	VIOLET PURPLE	clear	Island of Uto	Quartzum Amethystinum Crassede. a false gem.
5. SANDY PEBBLE CRYSTAL.							
Great lumps	very hard	very heavy	granulated	MILKY	cloudy	Sweden	Quartzum Granulatum Crassede. glaß.
6. GREENISH PEBBLE CRYSTAL.							
Small lumps	hard	heavy	rugged	PALE GREEN	clear	Sweden	Quartzum Granulatum Virefcens Crassede. glaß.

7. SHATTERY PEBBLE CRYSTAL.			rugged	WHIRE	breaks in- to broad Plates	Sweden	glafs.
Vaft maffes	hard	very heavy					
8. YELLOW SHATTERY CRYSTAL.			uneven	PALE YELLOWISH BROWN	flaky	Gold mines of Hungary	glafs.
Vaft maffes	very hard	heavy					
9. BLOCK CRYSTAL.			uneven	WHITISH	clear	Germany, in cracks of rocks	glafs.
Vaft ftones	very hard	heavy					
10. CURTAIN CRYSTAL.			undulated	CLEAR AND CO- LOURLESS	watery	Perfia	glafs.
Vaft fheets	hard	heavy					

• The names of authors run out to an immoderate length; thofe I give from them mark the difference of kind, and are a fort of rendering them from Specific, into Trivial; this may ferve as an inftance: the words *Quartzum Spatofum* are not in Cronstedt, but whoever turns to his chapter of *Quartzum*, and finds the name *Quartzum Textura Spatofa*, will know 'tis that quoted here, and fpare the *Textura*, I hope, with pleafure.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	C O L O U R.	QUALITIES.	P L A C E.	U S E S.
II. BLACK PEBBLE CRYSTAL.							
Vast lumps	very hard	very heavy	botryoid	BLACK	crackly	Sweden	Quartzum Ferream Cristall. an iron ore.
12. RUDDY PEBBLE CRYSTAL.							
Great masses	hard	very heavy	irregular	DULL RED	crackly	Smoland	Quartzum Cupro Mixtum Cristall. a copper ore.
13. JACOBINE PEBBLE CRYSTAL.							
Round lumps	very hard	heavy	wav'd	VEIN'D BLACK AND WHITE	dull	Sweden	Quartzum Aqueolatum. W.
14. WORM-EATEN PEBBLE CRYSTAL.							
In sieve-like masses	hard	heavy	rudd	BROWNISH	eaten in holes as it were	Germany	Lutum Strab.
15. RIDG'D PEBBLE CRYSTAL.							
In rounded masses	hard	very heavy	ridg'd	BROWNISH RED	raised in edges	Germany	Quartzum Granatum. W.

NATIVE FOSSILS.

CLASS V.

G E M S.

Hard, bright, sparkling; in small angulated masses; composed of fine Plates.

THE Gems are naturally angular, as are the Crystals: but like them, from various accidents in their formation, they are found sometimes in rude or shapeless masses; and when angular, they have still all that variation of Figure which we see take place in Crystal and Spar; from the different disturbances of their crystalization. In all these cases the various number of angles may be occasioned, as we see in Salts, from the accidents of their concretion. In these, as well as in those, we have the same kind in different Figures; and as we can crystalize them under the eye, we can determine the causes of those alterations. The round, or pebble Gems, seem not to have been original in that form, but worn to it by rolling about in a fluid.

The hardness and the lustre of the Gems, must distinguish them from all other Stones; for if we considered their form, as their essential character, many Crystals would assume the name: and Cronstedt

has well determined, that a certain Spar he had seen in Figure of the most regular Diamond, must then be call'd, a Diamond.

No peculiar construction, no form of constituent parts is visible in the Gems: they appear as masses of uniform nature; and they break irregularly and indeterminately; yet there is in all a really plated structure. The Lapidaries find this in some, and can split them; the burning glass discovers it in the rest; and when turned to it in a right direction, tears them to pieces: they split into the thinnest Plates that can be conceived, and seem to have been composed in the manner of the Talcs, only more compact. 'Tis pity this character is not more obvious: for it affords a real distinctive mark between the Gems, and all other Stones: Crystals, which seem to come nearest to them, have it not.

Their colours are less essential, for they can in most be driven away by fire; and nature sometimes gives the Gem without them; they are evidently owing to the metals; for we can by means of metals, give the same to glass; our artificial Gem.

The Salt System of Linnæus appears here almost ludicrous. To a truly philosophic eye, the difference of estimation and price are nothing; but the common Reader will hardly keep his countenance when he sees the Diamond reduced to a Species of Alum; and the Emerald of Borax.

D I A M O N D S.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. ORIENTAL DIAMOND.							
Octahedral	hardest	heaviest	brightest	LIVELIEST	most sparkling of all gems	East Indies	Adamas Gemma. W.
2. BASALTINE DIAMOND. BRAZIL DIAMOND.							
Dodecahædral	very hard	heavy	bright	LIVELY	sparkling	Brafsils	Le Diamant de Brésil de Lifse.

The form of the Brazil Diamond differs from the Oriental, as well as do its qualities : there are Shirly, or Basaltine, resemblances of all the Oriental Gems ; and this is such of the Diamond ; and no other. De Laet was acquainted with it, and with its qualities. Agricola knew its Dodecahædral form. Wallerius accurately describes its faces by their cubic shape. The Brazil Diamond has the same electric, and the same philosophic properties, with the Oriental : After it has been held

held in the sun, it has a silvery brightness in the dark; and the same quality, in some degree, when rubb'd: and it takes the foil, as the Oriental Diamond. But they all want the perfect hardness of the Oriental Diamond; and they have somewhat less specific gravity; and they can be melted by the extrem force of fire, which the Oriental Diamond cannot; it can only be torn into flat Flakes, and that way shews it has a structure such as the Zeolite, tho' like that it be obscure.

We are not to expect all Diamonds in their perfect crystallized form; we see them rounded in the manner of the pebble Crystals, and like all other crystallized Stones, they vary in the number of the angles, even in the same Species.

Like all the other crystalline stones, this is also liable to be tinged to all colours; but these tinges it receives in so small a quantity, and in a degree so delicate, that it is a doubt whether a coloured Diamond be not more beautiful even than a perfect clear one.

We talk of our vast Diamonds, the Tuscan, the Sancy, and Pitt's; but what are these to that of the Mogul, which before cutting weighed very near eight hundred carats?

I. E M E R A L D S.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. ORIENTAL EMERALD.							
A column with a Pyramid	very hard	heavy	bright, and polished	PURE GREEN	keeps its colour in the fire	Ægypt	ornament.
							Smaragdus Orientalis. W.

2. OCCIDENTAL EMERALD.

A Prism
without a
Pyramid

tender

heavy

glossy

PALE
GREENloses its
colour in
the fire.
luminous
in the dark
after
burning

Peru

ornament.

Smaragdus
Occidentalis,
W.

3. BRASILEMERALD.

A Prism
with two
Pyramids

soft

heavy

bright,
and
glossyDULL
GREENloses its
colour in
the firethe Brazils,
the Grenades
ornament.Smaragdus
Brasilensis
De Lacroix

2.

SAPPHIRE.

A Rhomb
of unequal
sides

very hard

heavy

glossy

FINE BLUE

keeps its
colour in
the firePegou,
Conanor,
Ceylon

ornament.

Sapphirus Mas,
W.

* This is the perfect form ; but we have said, how often it is altered, or defective, or rubb'd away, 'tis so in all ; but the true form should always be known.

† The Sapphire has been supposed the same Stone with the Diamond, but 'tis not so : we have blue Diamonds, which are not Sapphires ; and colourless Sapphires, which yet are not Diamonds ; but they are very near it : one passed thro' many Jewellers hands as such some years ago.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACES.	USES.
2. OCCIDENTAL SAPPHIRE.							
A furrow'd Prism with an obtuse Pyramid	tender	heavy	bright, but uneven	PALE BLUE	keeps its colour	Peru	Sapphirus Femina. W. ornament.
3. GRASS SAPPHIRE.							
An octangu- lar Prism with a Pyra- mid	soft	heavy	wavy	BLUE, WITH A TINGE OF GRASS GREEN	loses its colour in the fire	Bohemia	Sapphirus Subviridis. W. ornament.
3. RUBIES.							
1. ORIENTAL RUBY.							
Octohædral of trigonal Planes	extreamly hard	heavy	bright, and polished	PURE, PERFECT RED	keeps its colour in the fire	Pegou	Rubius Orientalis. W. ornament.

2. BRASIL RUBY.

A Prism of
unequal
sides, with a
triangular
Pyramid

hard

heavy

freaky

PALE RED

keeps its
colour in
fire

the Brazils

ornament.

Rubinus
Incaratus.
W.

3. SPINELL RUBY.

A Prism
with an irre-
gular Pyra-
mid

tender

heavy

scaly, but
bright

ROSE-
COLOUR

loses its
colour in
the fire

Peru

ornament.

Rubinus
Subalbus.
W.

4. TAWNY RUBY.

A short
Prism with
a long Pyra-
mid

tender

heavy

uneven,
and
freaky

BROWNISH
RED

loses its
colour in
the fire

Silefia

ornament.

Rubinus
Rubellus.
W.

4. TOPAZES.				USES.	
FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.
1. ORIENTAL TOPAZ.					
Two quadrangular Pyramids, base to base	extremely hard	heavy	bright, glossy	JONQUILLE YELLOW	keeps its colour in the fire ornament.
2. BRASIL TOPAZ.					
A Prism of four sides, with two Pyramids	hard	heavy	polish'd	GOLD YELLOW	loses its colour in the fire ornament.
3. ORANGE TOPAZ.					
A Prism with one Pyramid	tender	heavy	glossy	RUDDY YELLOW	loses its colour in the fire ornament.

Topazius.
W.

Topazius
Aureus
Crosted.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
4. SAXON TOPAZ.							
An octahedral Prism, with two Pyramids	hard	heavy	rugged	PALE BROWN, PALE YELLOW, OR COLOURLESS	bright	Schneckenstein, in Saxony	Topazius Saxonicus Cronstedt. ornament.
5. CHRYSOCLITE.							
1. ORIENTAL CHRYSOLITE.							
A Prism of six sides, with two Pyramids of four sides	very hard	heavy	polished	YELLOWISH GREEN	keeps its colour in the fire	Cananor	Chrysolithus Prasoides, W. ornament.
2. OCCIDENTAL CHRYSOLITE.							
A Prism of five sides, with no Pyramid	tender	heavy	bright	PALE GREEN, WITH A YELLOW TINGE	loses its colour in the fire	Brazils	Chrysolithus Cryopratus, W. ornament.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
3. GOLD CRYSO-LITE.							
A Prism with one Pyramid	hard	heavy	freaky	GOOD GREEN, WITH A CAST OF GOLD YELLOW	keeps its yellow in the fire	Peru	Chrysolitus Præf. W. ornament.
5. H Y A C I N T H S.							
1. ORIENTAL HYACINTH.							
A long Prism of four sides, with two Pyramids	very hard	heavy	striated	FLAME-COLOUR	keeps its colour in the fire	East Indies	Lyncurios Veterum. H. ornament.
2. BOHEMIAN HYACINTH.							
A short Prism of four sides, with one Pyramid	hard	heavy	smooth, and glossy	YELLOWISH RED, WITH A TINGE OF GREEN	keeps its colour in the fire	Bohemia, Poland	Hyacinth. Chrysoprase de Lisse. ornament.

3. JARGON HYACINTH. •

A long
Prism, with
one Pyramid

very hard

heavy

polished

PALE
YELLOWISH
RED

keeps its
colour in
the fire

France

ornament.

Jargon
d'Hyacinthe
De Lisle.

6. GARNETS.

1. ORIENTAL GARNET.

A short
hexædral
Prism with
two Pyra-
mids

hard

very
heavy

ridged

BLOOD RED,
FIRE-CO-
LOUR'D TO
THE LIGHT

keeps its
colour in
the fire

Pegou

ornament.

Grenate
Rouge
De Lisle.

2. SORANE GARNET.

A short
Prism, with
one Pyramid

very hard

very
heavy

glossy

DEEP
ORANGE
SCARLET

keeps its
colour in
the fire

East Indies

ornament.

Grenate
de Surian
De Lisle.

• This Stone is sometimes colourless, and has been call'd, a Soft Diamond; a term that needs no comment.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
3. JACYNTH GARNET.							
A long Prism, with two Pyramids	very hard	heavy	bright	CRIMSON, WITH A YELLOW TINGE	keeps its colour in the fire	Coromandel	Giacinto Garnetino De Lisle. ornament.
4. VIOLET GARNET.							
A short Prism, with one Pyramid	hard	heavy	polish'd	DEEP RED, WITH A PURPLE TINGE	keeps colour in the fire	Pegou	Rubino della Rocca De Lisle. ornament.
5. DEEP GARNET.							
Rounded and Polygonal	tender	very heavy	glossy	BLOOD RED	keeps its colour in the fire	Bohemia, in rocks	Grenat de Boheme De Lisle. ornament.
6. SPANISH GARNET.							
Globular, with many rhomboidal faces	tender	heavy	streaky	LIGHT RED	loses its colour in the fire	Spain, in slate	Grenat d'Espagne De Lisle. ornament.

8. BLACK GARNET. A short Prism, with two long Pyramids	very hard	very heavy	perfectly polished	ABSOLUTE BLACK	whitens in fire	Lapland	a poor iron ore. Granatus Niger Cronstedt.
	Rounded, and mul- tangular *	hard	glossy	PALE GREEN	whitens in fire	Saxony	ornament. Granatus Virescens Cronstedt.
	9. TOURMALINE GARNET. A Prism of nine sides, with two triangular Pyra- mids	hard	smooth	PURPLE	electrical when heated	Ceylon	curiosity. Lapis Electricus Aët. Ber.

* Nothing is more irregular than the crystallized form of the Garnets. Wallerius has assumed these variations as characters, that could be considered as permanent; and De Lisle counts in the same manner upon the inequality of their faces. I have examined a multitude, and find the same Stone varies in the number, and proportional breadth of the faces. What seemed most permanent in each, I have described, but owning still the uncertainty; he who would name Garnets from these differences, might make a thousand, but often a hundred of those would be the various crystallizations of the same Stone. What the Antients knew of them, and by what names they called them, may be seen in an edition of Theophrastus, which I published some time since; or more concisely in Mr. De Lisle, who has done me the honour to perpetuate that, and my name in his immortal work.

C L A S S VI.

S H I R L.

B A S A L T E S.

An impure crystalized Fossil, hard and heavy; in form of polygonal Prisms, with trigonal heads.

TIS necessary this should follow the Garnets; for 'tis ally'd to them most nearly in form, and qualities; the number of faces in the Prism is various, and the Head is often wanting, but the Body is always to be known: and tho' but lately understood, is worthy great attention.

Its constituent parts are variously put together, but in themselves they are always the same: thus we see fibrous, flaky, and glassy shirls: the structure of the Talcs, the Crystals, and the Spars, are seen in their fragments; but still the constituent substance is the same. No wonder those who looked but little farther than the surface, were perplexed with this; but to a deeper search all becomes plain.

Linnaeus refer'd the Shirls to Alum, for their form; De Boet considered them as Crystals: the late excellent

cellent Cronstedt seems to have understood them well : he first discovered their close resemblance to the Garnets ; and (discovering also the perfect uncertainty and vague determination of the sides and faces in the Garnets) connected both together for their matter ; and neglected (with great reason in his work) their form.

When pure, the Shirls strike fire with steel ; but some are so debased with earthy mixtures, that they do it poorly. None of them ferment at all with acids ; they all become electrical when heated : their number of faces varies in the same mass, one Prism being made to suit two others : as to size, we see them from that of Barley-Corn up to the Giant's causeway.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. STOLPEN SHIRL.							
A simple Polygonal column, with a trihædral head	very hard	very heavy	smooth	RAVEN GREY	ten foot long	Misnia	Basaltes de Stolpen. W. curiosity.
2. IRISH SHIRL. GIANT'S CAUSEWAY.							
Jointed columns	hard	heavy	smooth	PERFECTLY BLACK	immense, of various faces, but alike in all the joints of each column.	Antrim	Basaltes Hibernicus Pl. Trad. curiosity.
3. SPANISH SHIRL. CROSS STONE.							
A black and white cross	hard	heavy	glossy	BLACK, AND PURE WHITE	small, with the figure of a cross	Andalusia	Lapis Crucis. W. amulet.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
4. FLINTY SHIRL.							
An oblong black Prism, with two Pyramids	very hard	heavy	polished	BLACK	glassy, when broke	Germany	Borax Lapidus Triquetrus. L.
5. RUDDY SHIRL.							
An oblong, ruddy Prism, with one Pyramid	hard	very heavy	smooth	RUDDY BROWN	granulated	Nerike, in Sweden	Basaltus Rufus Cronstedt.
6. GREEN SHIRL.							
A short, green Prism, with one Pyramid	tender	heavy	glossy	PALE GREEN	cloudy within	Sweden	Basaltus Virens Cronstedt.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
7. MULTANGULAR SHIRL.							
A Prism of many sides, with two Pyramids	hard	heavy	polished	DEEP GREEN	foul within	Germany	Schort Verde Davila.
8. WHITISH SHIRL.							
White, long, angulated needles	tender	light	glossy	WHITISH, WITH A TINGE OF BROWN, OR BLACK	clustery	Bristol	Schort d'Aiguille Davile.
9. VESUVIAN SHIRL.							
A hexædral flatted Prism, with two Pyramids	hard	heavy	even	YELLOW-ISH, OR BLACKISH	clustery	Mount Vesuvius	Bafalte de Vesuvius De Lisse.

10. EMERALD SHIRL.
MOTHER OF EMERALDS*.

A Polygonal
Prism, with
one Pyramid

tender

heavy

polished

FINE
GREEN
cloudy
within

Ægypt

ornaments.

Balsates
Spatolus
Cronstedt.

11. STRIATED SHIRL.

A truncated
Prism of
many sides

hard

very
heavy

glossy

STAINS OF
RUDDY
BROWN,
BLACK, OR
GREEN
of a striat-
ed texture

Sweden

Balsates
Fibrosus
Cronstedt.

12. STARRY SHIRL.

Thick masses
of many
angles

tender

very
heavy

uneven

brownish,
clouded
with black
and green
radiated,
as a star

Sweden

Balsates Concentratus
Cronstedt.
Asbest Faulie. W.

* Mr. Dacosta errs, in supposing this not to be the Mother of Emerald: Cronstedt is a great authority; but the truth is confirmed by a much greater, that of our senses. I wish this ingenious and knowing mineralist had spared the unkind note on his great author.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
13. DEBAS'D SHIRL.							
Vast rude masses	hard	very heavy	irregular	BROWN, WITH GREY, RUDDY, OR BLACK SPOTS	stony	Sweden	Balsites Sarcus Croniada,

C R Y S T A L S.

O R D E R VIII.

Z E O L I T E S.

Pure Fossils in columnar forms, hard, heavy, bright, and flaky.

These resemble the Shirl in all things; but that, when viewed with good glasses, their texture is flaky. They are harder than Spars, but less hard than pure Crystal; they do not effervesce with acids, but they are soluble in that of Nitre; and the solution becomes a hard jelly.

They melt freely in the fire, and yield a light like the flame of electricity just in the moment of their fusion.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. JONQUILLE ZEOLITE.							
Convergent Pyramids	hard	heavy.	perfectly polished	JONQUILLE YELLOW	cluster'd, in small flakes	Sweden	Zeolithus Crysalizatus Cronstedt.
2. PURE ZEOLITE.							
A truncated Prism	hard	heavy	glossy	COLOUR- LESS	single, with fine flakes	Sweden	Zeolithus Distinctus Cronstedt.
3. HYACINTHE ZEOLITE.							
Small masses	tender	very heavy	glossy	FLAME- COLOUR'D	shattery	Sweden	Zeolithus Spatolus Cronstedt.
4. BLUE ZEOLITE.							
Rude masses	hard	very heavy	uneven	BLUE, WITH YELLOW AND WHITE SPOTS	breaks like flint	Persia	Zeolithus Ceruleus Cronstedt.
5. WHITE ZEOLITE.							
Large masses	very hard	heavy	rugged	YELLOWISH WHITE	flinty	Denmark	Zeolithus Darius Albus Cronstedt.

NATIVE FOSSILS.

CLASS VII.

ASBESTINE FOSSILS.

ASBESTIÆ.

Pure Fossils, composed of strait, parallel threads, flexible, but not elastic.

THE Asbestos bear the fire; and webs wrought of them may be cleaned by burning: but this is never done without a degree of injury; for on the most careful trials, I have always found Native Asbeste of the same kind more flexible than what has been burnt: there is a leathery toughness in most of the pure sorts, when kept as they were taken out of the earth; but it is lost by burning.

'Tis said, the Asbesti are formed of Talc, resolving itself into Clay: it must then have been striated in the plated state: but 'tis not so. Few people have glasses of more power than mine, and I have examined the purest Talc, but never seen this. If these authors would infer it from some debased talcy substances, which are striated, they want that precision, without which little is to be determined in this study. Besides, this change would infer, that the alteration of form
ren-

renders the same body different in the fire; the last and greatest of all tests of Fossils.

Talc is unalterable in the fire; Asbeste is hardened in it; and Clay runs to Glas: therefore, according to this plan, one body, Talc, can afford three different conditions in the fire; as it happens without mixture, for that is not supposed, only that it has changed its form. I reverence Linnæus, yet do not receive his assertion, *Mica concretio Argillæ*, as absolute and certain: nor will himself, when he has but given it this consideration: nor yet the general character, *Amianthus lapis ex Argilla*; till we have found *Mica Amianthus* and *Argilla*, suffer the fire alike. Nor will the opinion of Cronstedt overrule the doubt, for 'tis but an opinion; and I should have expected, and have wished, to have found it rather in any other author.

The Asbestos are the softest, and the lightest of all minerals; they have no determinate manner of breaking; they always lie in the beds with horizontal fibres; never perpendicular, and seldom much inclin'd; they are so tough you twist them like hemp; so light they swim on water: too soft for striking fire; and too fixed for all the power of acids. Some resemble animal, as others vegetable substances; and hemp and leather equally are imitated by them: some masses look like Fossil wood; and some like efflorescences of Salts, but they soon disclose their nature, on handling; separating easily into threads, and having nothing of a saline quality.

A S B E S T I N E

ASBESTINE FOSSILS.

ORDER I.

ASBESTE.

ASBESTUS.

Composed of strait, even, parallel, long threads.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. PURE ASBESTE*.							
Long, entire threads	tender	very light	glossy	GREY	most flexible	Siberia, Cyprus	Amiantus Alabastrus L. wicks of lamps

* This is spun into purfes, and made into paper ; but there is more in the name than the use.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
2. GLASSY ASBESTE.							
Bright, short threads	hard	heavy	polished	OLIVE-COLOUR'D	brittle	Sweden, Anglesea	Amiantus Fragilis, L. curiosity.
3. WOODY ASBESTE.							
Masses like fossil wood	hard	heavy	streaky	PALE BROWN	scarce separable into threads	Italy	Amiantus Immaturos, L. curiosity.
4. EARTHY ASBESTE.							
Flat, coarse plates	tender	heavy	clay-like, but striated	PALE GREY	breaks in parting	Germany	Amiantus Terrestris, L. curiosity.
5. RADIATED ASBESTE.							
In starry clusters	hard	heavy	glossy	OLIVE-COLOUR'D	moos-like	Sweden	Amiantus Radians, L.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
6. GREEN ASBESTE.							
Flat masses	tender	heavy	uneven	DIRTY GREEN	not to be separated into threads	Germany	Asbeste non Mur Verdâtre. W.
7. BLACK ASBESTE.							
Small masses	hard	heavy	glossy	DEEP BLACK	scarce separable	Crete	Asbeste non Mur Noirâtre. W.
8. CRYSTALLINE ASBESTE.							
Thin plates	hard	heavy	polish'd	COLOUR- LESS	not separable	Germany	Asbeste non Mur Transparente. W.
9. BRUSH ASBESTE.							
Small tufts	tender	heavy	rudd	GREYISH	firm	Sweden	Asbeste en Bouquets. W.

ASBESTINE FOSSILS.

ORDER II.

AMIANTH.

AMIANTUS.

Composed of slender, cluster'd fibres, intricately mixed.

THESE partake so much of the Asbestine nature, that they always lie lengthwise, not perpendicularly in their beds: and they split lengthwise only, tho' it be less regularly than the Asbestos. The Amianths will not spin into cloths, but paper may be made of some of them, and 'tis curious to see the writing burnt out, and the paper clean for fresh use: but the use is little.

Reiger has taken great pains to prove it a vegetable substance, not mineral; but his numerous reasons might have been all obviated, if he had thought of putting a bit of it into the fire.

It is singular, that a substance very much resembling the Amianths, may be made by art, with Arsenic, and the Vitriolic Acid.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. PLUME AMIANTH. PLUME ALUM.							
Oblong masses	soft	very light	woolly	PALE GREY	swims in water	Denmark	Amiantus Plumosus. irritation in palfies
2. CHAFF AMIANTH.							
Rough lumps	brittle	light	prickly	RUDDY GREY	sinks in water	Sweden	Lapis' Acerofus Rafilis. W.
3. HARD AMIANTH.							
Small clusters	hard	heavy	covered with points	GREY	sinks in water	Germany	Lapis Acerofus Rigidus. W.

4. PERPLEX'D AMIANTH.

Small masses	tender	heavy
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5. RUDDY AMIANTH.

Rude lumps	hard	heavy
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6. GREEN AMIANTH.

Large, flattened masses	tender	heavy
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unevenly streak'd	WHITISH	swims in water	Sweden
irregular	REDDISH	sinks in water	Germany
wav'd	DULL GREEN	sinks in water	Sweden

Amiantus
Implexus
L.

Byssus
Martialis
Cronstedt.

Byssus
Vireicens
Cronstedt.

a copper ore.

ASBESTINE FOSSILS.

ORDER III.

CARYSTINES.

CARYSTIA.

Composed of flaky plates, formed of inseparable, tough fibres.

THESE are in their original, fibrous, as well as the preceding kinds; but the fibres are formed into small flat flakes; and these flakes again into larger masses of the same form and kind. These are tough, flexible, and light; and to a stranger would appear rather of animal, or vegetable, than of Fossil origin. But the place where they are found, their structure when examined with glasses, and their resisting the force of fire, shew clearly what they are.

I. LEATHER

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. LEATHER CARYSTINE.							
Flat membranes in cracks of rocks	soft	very light	like flannel	YELLOWISH GREY	swims on water	Sweden	Amiantus Aluta. L.
2. FLESHY CARYSTINE.							
Thick, flat cakes	soft	light	undulated	WHITISH	swims on water, very flexible	Germany	Amiantus Caro Montan. L.
3. CORK CARYSTINE.							
Broad masses	soft	light	uneven	RUDDY BROWN	soaks in the water, and then sinks	Saxony	Amiantus Suber L.
4. YELLOW CARYSTINE.							
Great flakes	tender	heavy	wav'd	OCHREOUS YELLOW	sinks in water	Sweden	Caro Montana Flavicans Cronstedt.

NATIVE FOSSILS.

CLASS VIII.

EARTHS.

TERRÆ.

Fossils composed of imperceptible particles, united into firm, but not hard masses.

THE Earths are a numerous tribe ; but they have been supposed more numerous than they are : Sands have been counted among them, which are not of their nature, nor answer to their common character.

They are very important in their uses to mankind ; and therefore worthy a place in all cabinets ; tho' they add little to their beauty.

There are five principal kinds of Earths :

- | | |
|------------|------------|
| 1. CLAYS, | 4. MOULDS, |
| 2. CHALKS, | 5. BOLES, |
| 3. MARLES, | 6. OCHRES. |

These serve for purposes perfectly various ; and are in their nature evidently distinct ; and easily distinguishable by their characters.

Two are primitive Fossils, Chalk, and Clay ; Mould is perfectly adventitious, and variously mixed ; Marles have animal remains ; and Boles and Ochres have always a metallic mixture : the Alkaline Earths (here called Chalks, for the sake of a shorter name) have been supposed of animal origin ; and they are now received as such ; but the matter does not appear thus to me. I must be indulged in the use of my own experience ; but the reasons of my doubts will be seen, and may be judged by all.

Earths are tender, tho' compact ; they may be rubb'd to pieces in the hands, tho' some more difficultly than others : they disunite in water, but do not dissolve in it.

EARTHS.

E A R T H S.

ORDER I.

C L A Y S.

A R G I L L Æ.

Tough, ductile, heavy, smooth masses.

THE distinctions of Fossils are all relative: but they become absolute when viewed in comparison with the other bodies of the same kind: so these four words comprehend a character of Clay, by which it will be distinguished at sight from all other kinds of Earths.

This Distinction of an Earth from other Earths is all that should be attempted in the character of an Order.

The difference of Earths from other Fossils is given in the character of the Class.

Linnaeus describes Clay as a precipitation of a tough Sea-water. 'Tis well we need not enquire minutely into this; for it would not bear such enquiry.

Wallerius tells us, Clays are form'd of cubic particles. This we ought to enquire into; and I am sorry to say, we do not find it so. I wish it were; 'twould be a great natural distinction.

If we would lay down the Earths as Cronstedt, we must take in the Spars, the Crystals, Talcs, and even the Gems. Yet this was right in him, whose work was destin'd to the use of miners. Let me not seem to blame authors, where I decline adopting their opinions. These deserve respect, nay, reverence, all of them; but men are not infallible: and if one work were perfect, we need not labour after more.

All Clays look dull when broken; all soften and become unctuous in water; and all harden in the fire.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. WHITE CLAY.							
Vast strata, deep	very tough	very heavy	very ductile	PURE WHITE	unctuous	Ile of Wight	Argilla Apyra. L. tobacco pipes.
2. GREY CLAY.							
Vast strata	tough	heavy	ductile	GREYISH	fatty	Germany	Argilla Leucargilla. L. tobacco pipes.
3. PURPLE CLAY.							
Thin strata	very tough	heavy	very ductile	PALE VIOLET- COLOUR	unctuous	France	Argilla Vioacea. L. furnaces.
4. BLACK CLAY.							
Deep, thick strata	tough	very heavy	less ductile	BLACK	grows white in the fire	Montmartre	Argilla Nigra. L. tobacco pipes.

5. BLUE CLAY.

Vast strata | very tough | heavy

6. POT CLAY.

Vast strata | tough | heavy

7. PORCELANE CLAY.

Vast strata | brittle | heavy

8. YELLOW CLAY.

Vast strata | brittle | very heavy

very
ductile

ductile

not very
ductile

ductile
when wet

LEAD
COLOUR

GREY

WHITE,
WITH
SPANGLES

YELLOW,
WITH
SPANGLES

reddens in
the fire

reddens in
the fire

dry

dry

Leicester-
shire

Warwick-
shire

China

China

tiles.

pots and pans.

porcelane.

coarse porcelane.

Argilla
[Communis].
L.

Argilla
Figulina.
L.

Argilla
Porcellana.
L.

Argilla
Chinensis.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
9. LEMON CLAY.							
Vaſt ſtrata	tough	heavy	very ductile	VERY PALE YELLOW	unctuous	Taſſary	great pipe heads. <i>Argilla Lithomarga. W.</i>
10. DUSKY CLAY.							
Vaſt ſtrata	tough	heavy	very ductile	BROWNISH YELLOW	fatty, but coarſe	England	bricks. <i>Argilla Sterilis. L.</i>
11. RED CLAY.							
Thin ſtrata	brittle	heavy	ductile	PALE RED	dry	Sweden	<i>Argilla Incarnata. L.</i>
12. GREEN CLAY.							
Thin ſtrata	crumbly	light	not very ductile	COARSE GREEN, WITH SPANGLES	duſty	Egypt, Germany	<i>Argilla Talcoſa. L.</i>

13. TAWNY CLAY.

Vast strata

spongy

heavy

not very
ductileREDDISH
YELLOW

sandy

Wiltshire

poor pottery.

Argilla
Tumentana.
L.

14. DARK CLAY.

Vast strata

hard

heavy

crumbly

DEEP
BROWNfull of
small gra-
velWorcester-
shire

for ovens.

Argilla
Grandæna.
L.15. STAINING CLAY.
UMBER.Great
masses

brittle

light

crumbly

DUSKY
BROWNstains the
fingers

Italy

for painting.

Argilla
Umbra.
L.

16. EGYPTIAN CLAY.

Vast cakes

brittle

heavy

crumbly

LIGHT
BROWN

dusty

Ægypt

a manure.

Argilla
Nilotica.
L.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
17. UNDERBOG CLAY.							
Thick strata	tough	heavy	ductile	BLACKISH	styptic	Ireland	Argilla Vitriolica. L.

I have taken the Linnæan trivial names for Clays; for no author has understood their characters so clearly and distinctly: but the list is smaller here; for his 6th, 8th, and 14th, are Boles; his 7th, 17th, and 20th, Marles. These will be found in their places; but excepting for this mixture, which my specimens, and my experiments disclaim, his distinctions are excellent: and 'tis the purpose here to give, that author's names, who appears to have understood the particular body best; to use not one, but all; and give a short direction where 'tis best to seek farther accounts, than the nature of this work admits.

E A R T H S.

O R D E R II.

C H A L K S.

C R E T Æ.

Dry, dusty, light, brittle, staining masses.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. PURE CHALK.							
Vast strata	hard	heavy	compact	WHITE	hardest, as deepest	England	for lime. Calx Creta, L.
2. DUSTY CHALK.							
Vast masses	crumbly	heavy	brittle	WHITE	foul with stones	Sweden	a manure. Calx Marmoræ, L.
3. YELLOW CHALK.							
In great masses	brittle	heavy	dusty	YELLOWISH	foul with stones	Sweden	a manure. Calx Marmoræ Flava, L.
4. RUDDY CHALK.							
Vast lumps	hard	very heavy	brittle	REDDISH	sandy	Forest of Dean	lime. Calx Marmoræ Rubra, L.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
5. AGARICK CHALK.							
Flat, great cakes	soft	light	friable	PURE WHITE	stainy	Sweden	Calx Pulveris. L. white washing.
6. MOON CHALK. LAC LUNÆ.							
Great lumps, deep in rocks	very soft	very light	very brittle	PURE WHITE	stainy	Germany	Calx Gühr. L. an absorbent.
7. RED CHALK.							
Large, rude masses	hard	very heavy	brittle	FINE RED	stains	Germany	Crith Rubens. W. for painting.

E A R T H S.

O R D E R III.

M A R L E S.

Tender, crumbly, light, coarse masses.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
1. WHITE MARLE.							
Vast strata	soft	light	very crumbly	PURE WHITE	breaks swiftly in water	England	manure.
2. SALINE MARLE.							
Vast loose strata	brittle	heavy	crumbly	BROWN	salt taste	Palæstine	

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
3. CHINA MARBLE.							Terr. à Porcelaine, W.
Vast masses	compact	heavy	coarse, and uneven	WHITE LIGHT GREY	full of spangles	China	porcelaine.
4. CHALKY MARBLE.							Mame Cretacee, W.
Vast strata	firm	heavy	uneven	YELLOWISH WHITE	cleansing for woollen	Greece	for the fullers.
5. FULLER'S MARBLE. FULLER'S EARTH.							Argilla Fullonica, L.
Vast masses	soft	heavy	irregular	OLIVE- BROWN	most unctuous	England	for clothiers.
6. WHITE FULLER'S EARTH.							Smectis Griffa, W.
Thick strata	hard	heavy	glossy	GREYISH WHITE	soft	Germany	for cloaths.

Marg.
Rouge.
W.

Marg.
Fusca.
W.

Marg.
Columbina.
W.

Marg.
Flava.
W.

7. RED MARLE.

Deep strata

hard

light

rugged

RED

breaks
easily in
water

England

manure.

8. BROWN MARLE.

Vast strata

tender

light

uneven

BROWN,
MIXED
WITH GREY
AND
YELLOW

breaks
freely

England

manure.

9. DOVE MARLE.

Vast strata

hard

heavy

rough

DOVE CO-
LOUR, WITH
RED AND
BROWN

breaks
freely

England

manure.

10. YELLOW MARLE.

Deep strata

tender

light

dusty

DEAD
YELLOW

breaks
freely

England

manure.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
11. BLUE MARLE.							
Vast strata	hard	heavy	shattery	DEADBLUE, SIMPLE, OR VEIN'D	breaks slowly	England	Marga Cerulea. W. manure.
12. BLACK MARLE.							
Great masses	tender	heavy	crumbly	BLACK	breaks freely	England	Marga Nigricans. W. manure.
13. STEEL MARLE.							
Great lumps	hard	light	shattery	DEEP GREYISH	breaks in dice	England	Marga Ferre. manure.
14. PAPER MARLE.							
Thin flakes	soft	light	fillic	PALE GREY	splits into leaves	England	Marga Papiracea. manure.

15. SCALY MARLE.

Deep strata

soft

light

brittle

WHITE

splits

Holland

manure.

Marga
Tuffacea.
L.

16. SHELL MARLE.

Thick strata

tender

light

very
brittle

WHITISH

crumbly

England

manure.

Marga
Conchacea.
L.

17. SAND MARLE.

Vast strata

hard

heavy

stony

PALE
BROWN

firm

England

manure.

Marga
Lapidifica.
W.

18. CLUSTER MARLE.

Vast
lumps

tender

light

rudd

DEEP
BROWN

crumbly

Holland

manure.

Marga
Tophacea.
W.

• There is evidently, Clay in this Marle; and Cronstedt has great reason on his side, when he calls Marle a mixture of calcarious and clayey Earth.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
Thin strata	hard	heavy	uneven	PALE GREY	mark'd with figures of moles	Germany	manure.
20. SHELL MARLE.							
Vast strata	tender	light	rugged	BROWN, AND WHITE	full of shells	Woolwich	manure.

* Many of the Marles have frequently Shells in them; but this is almost composed of them. 'Tis a doctrine, that all Marles are formed of decayed Shells; and this is, by those authors, supposed yet imperfect, or unripe; but there are Marles that have nothing shelly in them.

E A R T H S.

O R D E R IV. M O U L D S.

Impure, crumbly, light, mixt Earths.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOR.	QUALITIES.	PLACE.	U S E S.
1. PURE MOULD.							
A loose dust	tender	very light	smooth	PALE BROWN	impalpable	every where	the food of vegetables.
2. DUSKY MOULD.							
A coarse dust	soft	light	uneven	DEEP BROWN	granulated	every where	the bed of plants.
3. LAKE MOULD.							
Deep beds	very soft	heavy	smooth	BLACKISH	impalpable	under water	rich manure.
4. RED MOULD.							
Thick strata	tender	heavy	ruddish	DUSKY RED	crumbly	Northamptonshire	rich land.

Humus
Dedalea.
L.

Humus
Ruralis.

Humus Lacustris Lutum.
Crausset.
L.

Terra Adamica.
Humus Damascena.
L.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
5. HEATH MOULD.							
Deep beds	hard	light	uneven	DEAD BROWN	barren	on heaths	none. <i>Humus Pauperata L.</i>
6. LOOSE MOULD.							
superficial beds	tender	light	uneven	BLACKISH	swelling with wet	in gardens	throws up roots <i>Humus Effarvicensis L.</i>
7. BINGY MOULD.							
Deep beds	tender	light	smooth	UMBER- COLOUR'D	wet	on mountains	bed of Alpine- plants <i>Humus Alpinus L.</i>
8. TURF MOULD.							
Deep beds	tender	light	rudded	RUDDY BROWN	mixt with roots and bitumen	in bogs	for firing. <i>Humus Turfus L.</i>

9. IRON MOULD.

Thick beds

tender

heavy

smooth

INXY

vitriolic

Sweden

for dying black.
Humus Tinctoria.

10. BLACK MOULD.

Superficial strata

tender

heavy

rugged

DEEP
BLACK

hardens in
air

England

a rich land.
Humus Picea. L.

11. SLATE MOULD.

Superficial strata

hard

heavy

plated

RUDDY
BROWN

filifil

England

an alum ore.
Humus Schistosa. L.

12. STAINING MOULD.

Great lumps

soft

light

crumbly

BLACK

stains like
chalk

Sweden

for colouring.
Humus Nigrica. L.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
13. RAVEN EARTH.							
Great masses	hard	heavy	uneven	RAVEN GREY	crumbly	Sweden	Humus Lenticularis. L.
14. ANIMAL EARTH.							
Dust	soft	light	even	BROWN	tender	church-yard	Humus Animalis. L.

E A R T H S.

O R D E R V.

B O L E S.

Smooth, soft, heavy, unctuous, tender masses.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
1. WHITE BOLE ARMENIC.							
Thick lumps	firm	very heavy	polished	PURE WHITE	melts in the mouth	Armenia	Argilla Bolus. L. Bolus Alb. H. a medicine for fluxes.
2. BRITTLE WHITE BOLE.							
Thin strata		heavy	dusty	WHITE	unctuous	Germany	Bolus Friabili. H. a medicine for poison.
3. GREY BOLE.							
Vast masses	hard	heavy	smooth	GREYISH WHITE	crumbly	Greece	Bolus Electria. H. Bol Grise. W. a medicine.
4. YELLOW BOLE ARMENIC.							
Thick strata	tender	heavy	polished	PALE YELLOW	melts in the mouth	Greece	Bolus Armenica Galeni. H. a medicine for fevers.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
5. BOLE OF BLOIS.							
Thick masses	soft	light	dusty	GOOD YELLOW	melts in the mouth	Blois and Tokay	Bolus Blétois. H. an astringent.
6. YELLOW LEMNIAN EARTH.							
Thick cakes	very hard	heavy	dusty	FULL YELLOW	breaks in flakes	Greece	Terra Lemnia Flava. H. an astringent.
7. ORANGE BOLE.							
Thick cakes	tender	light	smooth	REDDISH YELLOW	melts in the mouth	Livonia	Terra Sigillata • Livonica Lutea. H. for fevers.
8. RED BOLE ARMENIC.							
Deep strata	very hard	heavy	dusty	DEEP YELLOWISH RED	sticks to the tongue	Armenia	Bolus Rubra (Dorisian). H. for fluxes.

9. RED FRENCH BOLE.

Thick strata tender very heavy

PALE RED,
WITH YEL-
LOW VEINS

near Paris

for fluxes.

Bolus Rubra
Gallica.
H.

10. STRIGA EARTH.

Thick strata tender light

brittle

Hungary

for fevers.

Terra Sigillata
Strigonicensis.
H.

11. TUSCAN BOLE.

Vast masses friable very heavy

gritty

Tuscany

for fevers.

Terra Sigillata Rubra
Magni Ducis.
H.

12. RED LEMNIAN EARTH.

Thick strata very hard heavy

melts in
the mouth

Greece

for fevers.

Terra Lemnia
Rubra.
H.

* Many of these medicinal Earths come to us, seal'd; and there have been thought to be more than there really are: these seem, on a careful enquiry, to be all the truly distinct kinds.

17. BLACK BOLE.

Vast lumps very hard

heavy

PERFECTLY
BLACK

glossy

bitumi-
nous

Germany

afstringent.

Le Bol
Noir.
W.

18. DUSKY BOLE.

Thin cakes hard

heavy

BLACKISH

rough

green,
when
powder'd

Sweden

an iron ore.

Bolas
Squamosa
Cronstedt.

E A R T H S.

ORDER V.

O C H R E S.

Dry, dusty, staining, fine masses.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOR.	QUALITIES.	PLACE.	USE S.
1. DUSTY WHITE OCHRE.							
Small pieces	friable	very heavy	dusty	PURE WHITE	crumbly	Sweden	Ochra Plumbea L. a lead ore.
2. FIRM WHITE OCHRE.							
Small lumps	hard	very heavy	smooth	WHITE	stains the hands	Germany	Ochra Zincæ L. a Zink ore.
3. YELLOW OCHRE.							
Thin strata	soft	light	dusty	BRIGHT YELLOW	crumbly	England	Ochra Ferri L. a paint.
4. TAWNY OCHRE.							
Great masses	tender	very heavy	uneven	TAWNY YELLOW	brittle	Sweden	Ochra Cobaltæ L. a paint.

5. GOLD OCHRE.

Thin masses tender

light

rugged

BRIGHT
YELLOW

crumbly

England

Ochra
Theophrasti.
H.

a paint.

6. SAFFRON OCHRE.

Flat cakes brittle

light

uneven

SAFFRON
YELLOW

flaky

Northamp-
tonshire

Ochra
Aricea.
H.

a paint.

7. NAPLES OCHRE.

Large lumps brittle

heavy

rugged

FINE
YELLOW

crumbly

Italy

Ochra
Giallolica.
H.

a paint.

8. RED OCHRE.

Vast cakes brittle

very
heavy

uneven

STRONG
RED

crumbly

England

Ochra Sili-
Syniacum
H.

a coarse paint.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
9. PURPLE OCHRE.							
Great lumps	tender	very heavy	dusty	PURPLISH RED	friable	Spain	Ochra Sil Atticum. H. a paint.
10. CRIMSON OCHRE.							
Great cakes	hard	extremely heavy	uneven	DEEP PURPLISH CRIMSON	gritty	Isle of Ormuz	Ochra Purpurea. H. a paint.
11. VENETIAN OCHRE.							
Great cakes	tender	light	dusty	PALE RED	perfectly pure	Venice	Ochra Veneta. H. a paint.
12. SINOPIA OCHRE.							
Thick masses	compact	very heavy	smooth	DEEP RED	soft to the touch	Greece	Ochra Sinopica. H. a paint.

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13. RED CHALK OCHRE.

Great masses very hard heavy

unctuous

GOOD RED

polished

Italy

a paint.

Ochre
Creta Rubra.
H.

14. MARBLE OCHRE.

Great masses stony hard heavy

dusty

STRONG
RED

uneven

China

a paint.

Ochre Sil
Margarosunt
H.

15. RUSTY OCHRE.

Small cakes tender very heavy

green,
when
dissolv'd

RUST CO-
LOUR,
BROWN,
RED

rough

Sweden

a copper ore.

Ochre
Cupri.
L.

16. GRAIN'D RED OCHRE.

Small lumps soft very heavy

granulat-
ed, and
thready

RUSTY RED

rugged

Sweden,
in iron mines
and on iron

a paint.

Ochre
Ferrug.
L.

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FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
17. STREAKY RED OCHRE.							
Small lumps	tender	heavy	fibrous	PALE RED	plumose	France	Ochra Stibige. L. a paint.
18. GREEN OCHRE.							
Small masses	friable	light	granulated	GOOD GREEN	dusty	Germany	Ochra Æris. L. Ochra Chrysocolle. H. a paint.
19. CHRYSOLITE OCHRE.							
Rough lumps	brittle	heavy	uneven	YELLOWISH GREEN	green, when dissolv'd	Sweden	Ochra Nickelia L. a paint.
20. FIBROUS GREEN OCHRE.							
Small masses	tender	light	rugged	PALE GREEN	crumbly	Virginia, on copper ore	Ochra Ærege. L. a paint.

21. SOFT BLUE OCHRE.

Great lumps

friable

heavy

LIGHT
BLUE

hisses in
water

Germany

a paint.

Ochra Lapis
Armenus.
H.

22. HARD BLUE OCHRE.

Small lumps

hard

heavy

GOOD
BLUE

earthy

Sweden

a paint.

Ochra
Cupria
L.

23. STRIATED BLUE OCHRE.

Great lumps

tender

very
heavy

FINE BLUE

fibrose

Germany

a paint.

Ochra
Cuprigo.
L.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOR.	QUALITIES.	PLACE.	USES.
24. BLACK OCHRE.							
Great masses	tender	light	uneven	BLACKISH	crumbly	Leicester-shire	a paint. Ochra Magnetica L.
25. FIBROSE BLACK OCHRE.							
Small lumps	hard	very heavy	freaky	DEEP BLACK	thready	Saxony	a silver ore. Ochra Argentifera L.
26. BLACKISH TRIPELANE OCHRE.							
Great masses	hard	heavy	uneven	BLACKISH, OR BROWN	dusty	Warwick-shire	for polishing. Ochra Tripelana Fuchs. M.

P A R T II.

COMPOUND FOSSILS.

Form'd by mixture of two, or more of
the Native, Earthy kinds.

C L A S S I.

S E M I - P E L L U C I D G E M S.

Hard, heavy, rounded masses: rude on the surface,
smooth where broken, and composed of impercep-
tible particles.

THESE do not ferment with Acids: they strike
fire with steel, and they take a delicate polish.

They all encrease in weight by calcination; in the
manner of Lead, and some other metals. 'Twas Hen-
kel first astonished the world with this account: and
by repeated trials, I have found it true, but in va-
rious degrees.

They all run in the fire, and make glass; to this
purpose those serve best which have least colour, or
come nearest to pure Crystal. Cronstedt says, there
are kinds which make a glass, that is injured by Acids;
and those so weak, as what are in the Rhenish and
Moselle wines.

COMPOUND FOSSILS.

ORDER I. OPALS.

Uniform, almost pellucid, varying the shades of colours with the light.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. PURE OPAL.							
Small lumps	hard	heavy	raised in lumps	PALE, AND CHANGE-ABLE	almost transparent	India, Ægypt	Siliceous Opals. L. ornament.
2. WHITE OPAL.							
Larger lumps	soft	light	uneven	MILKY, AND CHANGE-ABLE	opaque	Arabia	Opalus Albus. Cristall. ornament.

3. OLIVE OPAL.	Small masses	hard	heavy	tuberous	PALE BROWN, CHANGE- ABLE	red, when seen thro'	Ægypt	Opalus Pederota Cronstedt.	ornament.
4. YELLOW OPAL.	Larger lumps	tender	heavy	rugged	YELLOWISH, A LITTLE CHANGE- ABLE	ruddy, when seen thro'	Saxony	Opalus Flavescens. W.	ornament.
5. BLACK OPAL.	Small masses	hard	heavy	glossy	COAL BLACK, CHANGE- ABLE, WITH YELLOW	obscure	East Indies, Germany	Opalus Niger. W.	ornaments.
6. CAT'S EYE.	Rugged lumps	hard	light	raised in bumps	YELLOWISH, CHANGE- ABLE, WITH WHITISH	obscure	Ceylon, Siberia	Sillex Pseudoopalus. L.	ornaments.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. WORLD'S EYE.							
Small masses	hard	heavy	irregular	GREYISH, BROWN	transparent, in water	East Indies	ornament.
							Silix Oculas Mondia L.

COMPOUND FOSSILS.

ORDER II.

ON Y X E S.

Plated, opaque, variously coloured, in distinct beds.

Plated, opaque, variously coloured, in distinct beds.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USE S.
1. ARABIAN ONYX.							
Small lumps	hard	heavy	warted	BLUEISH GREY	beds of black and white	East Indies	Onyx Corneus. W. rings.
2. BROWN ONYX.							
Larger lumps	hard	heavy	tabulated	GREY	beds of dead brown	Conanor	Onyx Circuli's Fucis. W. ornaments.
3. CAMÆAN ONYX.							
Small lumps	hard	heavy	tilly	BLACK, AND WHITE	separate thick beds	East Indies	Onyx Memphitis. W. for engraving gems.
4. SARDONYX.							
Small lumps	hard	heavy	undulated	RUDDY, BROWNISH	beds of white	Ægypt	La Sardonyx. W. for gems.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
5. SIBERIAN ONYX.							
Small lumps	very hard	heavy	uneven	GREY	veins of flesh- colour	river Tomin, Siberia	Onyx Carnea Cionfctd. ornaments.

COMPOUND FOSSILS.

ORDER III.

JASPO NYXES.

Opake of various colours, in thick veins, blotches, or spots: not in plates.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. CLOUDED JASPONYX.							
Large lumps	hard	heavy	wav'd, and warted	PALE RED	grey, cloudy within	Arabia	boxes.
2. SPOTTED JASPONYX.							
Small masses	tender	heavy	rugged	DULL GREEN	spots of pale red	Ægypt	snuff boxes.

Jasponyx
Capinas.
W.

Jasponyx
Mouchetta.
W.

COMPOUND FOSSILS.

ORDER IV.

CHALCEDONY.

Dusky, clouded, and mixed of various colours.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. GREENISH CHALCEDONY.							
Little lumps	very hard	heavy	coated	GREYISH GREEN	uneven veins	Ægypt	Snuff boxes. Chalcedonius Græco Spadicæus. W.
2. BROWN CHALCEDONY.							
Large lumps	hard	heavy	wav'd	BROWNISH GREY	clouded	Ægypt	ornament.
3. RAINBOW CHALCEDONY.							
Small masses	soft	heavy	botryoid	BLUEISH GREY	red, green, yellow rainbows	East Indies	toys.
4. MILK CHALCEDONY.							
Great lumps	soft	heavy	scaly	MILKY	thin clouds of grey	Tartary	for idols.

5. BLUE CHALCEDONY.

Large lumps | hard | heavy

6. LINEATED CHALCEDONY.

Large lumps | hard | heavy

GREYISH
BLUE

unspotted

lines and
spots of all
colours

Ceylon,
Siberia

ornament.

Chalcedonius
Ceruleus
Cronstedt.

ornament.

Chalcedonius
Lineatus,
W.

COMPOUND FOSSILS.

ORDER V.

CARNELIANS.

, Tolerably pellucid, pure, or veined in circles, not in beds.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
1. RED CARNELIAN.							
Large lumps	hard	heavy	crusted	PALE RED	without veins	Arabia	Silet Carniolus. L. toys.
2. WHITE CARNELIAN.							
Large lumps	hard	heavy	smooth	MILKY WHITE	cloudy	Ægypt	Carniolus Albescens. W. toys.
3. YELLOW CARNELIAN.							
Small masses	tender	heavy	warted	AMBER- COLOUR'D	dusky	Ægypt	Carniolus Flavescens Crustcd. toys.
4. BROWN CARNELIAN.							
Small lumps	hard	heavy	crusted	PURE BROWN	cloudy	Siberia	Carniolus Flavofuscus Crustcd. toys.

5. BLOODY CARNELIAN.

Beryllus
Scheuchzer,
W.

Small lumps very hard heavy

smooth

DEEP RED

clear

East Indies

a jewel.

6. DOTTED CARNELIAN.

Carniolus
Stigmata.
W.

Small lumps very hard heavy

warted

WHITISH
RED

spots of
blood red

East Indies

ornament.

7. VEINY CARNELIAN.

Carniolus
Linnetus.
W.

Small lumps tender light

smooth

PALE RED

veins of
deep red

Arabia

ornament.

COMPOUND FOS SILS.

ORDER VI. AGATE S.

Clear, hard, veined, flinty, and rugged on the surface.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
1. GREY AGATE.							
Large lumps	very hard	heavy	raised in round bumps	DE GREY	veins of black and white	Germany	for toys.
2. BROWN AGATE.							
Small lumps	very hard	very heavy	warted	DEEP BROWN	vein'd with grey and white	Italy	for toys.

solz.
Achates
Chalcidians
Cyathids.

for toys.

Achates
Niger.
W.

toys.

Silex
Surdus.
L.

toys.

toys.

L'Agate
teonine.
W.

toys.

3. MILK AGATE.	Large lumps	hard	heavy	raised in lumps	MILKY & GREY	concentric circles of white	Africa	Germany	Italy	Germany	toys.
4. BLACK AGATE.	Small lumps	hard	very heavy	botryoid	BLACK, WITH PALE VEINS	keeps its colour in the fire	Germany	Germany	Italy	Germany	toys.
5. DOTTED AGATE.	Small maffes	soft	very heavy	rough	PALE GREY	red dots, and streaky	Germany	Germany	Italy	Germany	toys.
6. TAWNY AGATE.	Large lumps	hard	heavy	botryoid	BROWNISH YELLOW	undulated	Germany	Germany	Italy	Germany	toys.

FOR M.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USE S.
7. HYENA AGATE.							
Large lumps	hard	heavy	rugged	OLIVE BROWN	smoaky	Germany	toys. L'Agate Hyane. W.
8. PANTHER AGATE.							
Large lumps	very hard	heavy	grape like	YELLOWISH	dusky spots	Palatinate	toys. L'Agate Pourthere. W.
9. WHITE VEIN'D AGATE.							
Large masses	very hard	heavy	bubbly	DEEP BROWN	white veins	Hartz forest	toys. Achates Variegatus Cronstedt.
10. VIOLET AGATE.							
Small lumps	hard	heavy	warted	VIOLET PURPLE	dusky veins	Germany	toys. Achates Vio accus Cronstedt.

Achates
Hemachates.
W.

toys.

Achates
Sardachates.
W.

toys.

Achates
Jaspachates.
W.

toys.

Achates
Quadricolor.
W.

toys.

11. BLOOD AGATE.

Small lumps

soft

heavy

bumps,
and ridings

BLACK

blood red
spots

Germany

12. FLESH AGATE.

Small lumps

hard

heavy

waved

GREY

flesh-
colour'd
spots

Oberstein

13. GREEN AGATE.

Large lumps

soft

heavy

warted

PALE
GREEN

red spots

Germany

14. ORANGE AGATE.

Large lumps

hard

very
heavycrusted,
and roughDUSKY
YELLOWblack, red,
and green
veins

Germany

COMPOUND FOSSILS.

ORDER VII. M O C C O A S.

Semipellucid, smooth, very hard, with black delineations.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUANTITIES.	PLACE.	U S E S.
1. CLEAR M O C C O A.							
Small lumps	very hard	heavy	smooth	COLOUR- LESS	with black mosses	East Indies	ornament. L'Agate Coralline. W.
2. BROWN M O C C O A.							
Small lumps	hard	heavy	uneven	PALE BROWN	figures of trees	East Indies	ornaments. Dendrachates Woodward.

3. WHITE MOCOCA.

Small lumps

hard

heavy

botryoid

WHITISH,
OR
MILKY

forms of
silver ores

Germany *

ornament.

Achatas
Mocoensis.
W.

* Wonders have been related of these Mocoas; but they have been fictitious: we have been astonished with the forms of sun, moon, and stars; the shapes of Insects, the arms of nations, and, even human figures: but when we know that a solution of silver will follow a tool, and give any delineations we please on Stones, of this quality, we find the origin of these more than natural productions. Mocoas may be made thus, with pretty figures, like the natural, as well as with romantic follies; and 'tis strange, that when the lines decay, and begin to disappear, laying the Stone in the sunshine recalls them. Linnaeus does not distinguish the Mocoas from the Agate; and Wallenius enumerates those with forms of crowns, and human figures, and the like: but the fact is, the Mocoas differs from the Agate; for it is harder; but the colours of the Stone, not the delineations, are to mark the different kinds.

COMPOUND FOS SILS.

ORDER VIII.

SWALLOW STONES.

Small, rounded, or oval, smooth.

SWISS' LONGETY' OL OAG' UNOOP.

FORM.		HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. CONVEX SWALLOW STONE.								Hirondelle Concave. W.
Low raised		tender	heavy	polished	PALE BROWN	concave below	Germany	
2. HIGH SWALLOW STONE.								Hirondelle Demi-sphérique. W.
Raised high		hard	heavy	botryoide	WHITISH	hami- sphere	Saxony	
3. CRAB'S EYE SWALLOW STONE.								Hirondelle Ovale. W.
Oval		hard	heavy	polished	GREY	in lumps of Agate	Germany	
4. CORNER'D SWALLOW STONE.								Hirondelle Quarré. W.
Square		soft	light	rudd	MILKY	hollowed below	Germany	

COMPOUND FOSSILS.

ORDER IX.

JASPER S.

Opake, rough, in vast masses.

I. PLAIN JASPER S.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	C O L O U R.	QUALITIES.	P L A C E.	U S E S.
I. GREY JASPER.							
Vast masses	hard	very heavy	rudd	DULL GREY	breaks like flint	Sweden	Siles Jaspis. L.
2. WHITE JASPER.							
Great masses	very hard	heavy	uneven	FINE BLUEISH WHITE	polishes finely	Germany	Petroflex Albus. W.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
3. RED JASPER.							
Great pebbles	hard	heavy	even	RED	glossy	gravel pits in England	Homochroon Rubens. H.
4. YELLOW JASPER.							
Vast blocks	very hard	heavy	rugged	PALE YELLOW	sparkling	Hampstead-heath	Jaspis Flava. W.
5. IRON JASPER.							
Rounded lumps	hard	very heavy	smooth	BRIGHT IRON GREY	faint	Germany	Jaspis Martialis Cronstedt.
6. BROWN JASPER.							
Rugged lumps	very hard	very heavy	wrinkled	DEAD BROWN	shining	Sweden	Jaspis Spadicea W.

Jaspis
Aetnusa
Plini.

Homochroum
Virefcens.
Cronst.

Jaspis
Nigra
Cronstedt.

Jaspis
Virens
Cronstedt.

7. BLUE JASPER.

Rounded
lumps

very
heavy

glossy

FINE BLUE

flinty

Italy

8. GREEN JASPER.

Rounded
lumps

hard

heavy

smooth

DULL
GREEN

marbly

Suffex

9. BLACK JASPER.

Vegetable
rocks

very hard

heavy

uneven

PERFECTLY
BLACK

stony

Germany,
Sweden

2. VEIN'D JASPER S.

10. GREEN AND YELLOW JASPER.

Small masses

hard

very
heavy

smooth

GOOD
GREEN

yellow
spots

Bohemia

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
11. BLOODSTONE JASPER.							
Small lumps	hard	heavy	smooth	BLUEISH GREEN	blood red spots	Ægypt	Jaspis Heliotropium Crosted.
12. YELLOW AND WHITE JASPER.							
Great blocks	very hard	heavy	crack'd, and flaw'd	PEARLY WHITE	yellow blotches	Germany	Jaspis Variegata Albescens. W.
13. RED AND BLACK JASPER.							
Large lumps	hard	very heavy	raised in bumps	BLOOD RED	green and black spots	Italy	Diaspro Rosso Crostede.
14. RED AND YELLOW JASPER.							
Small blocks	very hard	heavy	perfectly even	DUSKY RED	yellow veins and spots	Ægypt	Diaspro Flavido Crostede.

15. BROWN AND WHITE JASPER.		Jaspis Variegatofusca. W.	
Large lumps	hard	very heavy	uneven
		PALE BROWN	white blotches
			Germany
16. PANTHER JASPER.		Jaspis Variegata Viridis. W.	
Great lumps	less hard	heavy	uneven
		GREEN	yellow and red blotches
			Germany
17. GARAMANTINE JASPER.		Jaspis Lincis Albis. W.	
Small lumps	very hard	heavy	glossy
		DEEP RED	white blotches
			Ægypt
18. AZURE JASPER.		Lapis Lazuli. W.	
Small lumps	hard	heavy	crack'd
		FINE BLUE	yellow and white veins and spots
			Arabia
			a copper ore.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
19. ARMENIAN JASPER.							
Small masses	less hard	heavy	smooth	LIGHT BLUE	white spots	Egypt	Lapis Armenius W.
20. SAPPHIRINE JASPER.							
Small masses	hard	heavy	glossy	DEEP BLUE	gold dots	East Indies	Lapis Radiatus W.
21. BROWN ROCK JASPER.							
3. ROCK JASPER S.							
Whole strata	hard	very heavy	rugged	PALE BROWN	flinty	Germany	Petrofide Lucidatufus W.
22. UMBER ROCK JASPER.							
Whole rocks	tender	heavy	wavy	DEEP BROWN	glassy	Sweden	Petrofide Obscuratufus W.

23. VEIN'D ROCK JASPER.

Vaſt rocks hard heavy

Germany

Petroſilex
Venofus.
W.

24. SAND JASPER.

Vaſt maſſes leſs hard very heavy

Italy

Petroſilex
Arenaceus.
W.

AGATE JASPER S.

25. PEARLY AGATE JASPER.

Great rocks very hard very heavy

Germany

Petroſilex Semipellucidus.
Albus.
W.

26. RED AGATE JASPER.

Great maſſes hard heavy

Germany

Petroſilex Semipellucidus
Rubeſcens.
W.

brown
veins

white and
yellow
dots

GREENISH

RUDDY
BROWN

rough

rugged

white
lines

WHITISH

rugged

duſky
ſpots

PALE
REDDISH

uneven

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
27. VEIN'D AGATE JASPER.							Petrofex Semipellucidus Venosus. W.
Great masses very hard		heavy	smooth	BROWNISH	white and red veins	Bohemia	
28. PEACOCK AGATE JASPER.							Petrofex Semipellucidus Variegatus. W.
Great blocks less hard		very heavy	bubbled	RUDDY	black and yellow veins	Germany	

COMPOUND FOSSILS.

ORDER X.

P E B B L E S.

Rounded, hard masses, covered with a crust, and formed of circular coats, round a central nucleus.

Rounded, hard masses, covered with a crust, and formed of circular coats, round a central nucleus.

[225]

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. RED AND WHITE PEBBLE.							
Oval	hard	heavy	rugged	NUCLEUS YELLOW	crusts red and white	Hampstead- heath	Calculus Albo Rubens. H.
2. BLACK AND WHITE PEBBLE.							
Round	hard	heavy	uneven	NUCLEUS TAWNY	crusts black, white, yellow	Kenfington	Calculus Nigro Albus. H.
3. BROWN AND WHITE PEBBLE.							
Oblong	hard	heavy	reticu- lated	LARGE BROWN NUCLEUS	crusts white and brown	Hertford- shire	Calculus Fusco Albus. H.
4. BLUE AND RED PEBBLE.							
Round	hard	heavy	smooth	LARGE GREY NUCLEUS	red, blue, and brown crusts	Windsor	Calculus Czruleo Rubens. H.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
5. WHITE COATED PEBBLE.							
Uneven masses	hard	heavy	rough	RED, WHITE, AND BROWN	a thick white crust	Hampstead	Calculus Corticofus H.
6. BLUSH AND WHITE PEBBLE.							
Round	hard	heavy	wrinkled	NUCLEUS BLUEISH	thin crusts of two reds, white and yellow	Hertford- shire	Calculus Rosaceus. H.
7. PURPLE PEBBLE.							
Oval	hard	heavy	smooth	NUCLEUS FLESH- COLOUR'D	crusts purple and yellow	Hampstead	Calculus Purpurascens. H.
8. MAGPYE PEBBLE.							
Oval	hard	heavy	wrinkled	NUCLEUS BLACK	crusts black and white	Leicester- shire	Calculus Maculatus. H.

9. GREEN AND WHITE PEBBLE.			uneven	NUCLEUS GREY	crusts white and green	Northamp- tonshire	Calculus Albo Virens. H.
Round	hard	heavy					
10. RAINBOW PEBBLE.			smooth	NUCLEUS SMALL AND RUDDY	thin crusts of all colours	Leicester- shire	Calculus Vericolor. H.
Round	hard	heavy					
11. EGYPTIAN PEBBLE.*			wrinkled	NUCLEUS BROWNISH WHITE	crusts tawny, brown, and black	Ægypt	Calculus Ægyptiacus. H.
Oblong	hard	heavy					
12. BROWN AND YELLOW PEBBLE.			smooth	NUCLEUS GREEN	crusts brown and yellow	Hampstead	Calculus Fuscoflavus. H.
Oval	hard	heavy					

* The Egyptian Pebble is eminent for its Mocoa-like variegations; and for the more than ordinary oddities of its veins and spots. Few Fossils require more care in the distinction than the English Pebbles. I once thought them more numerous; but these seem, on strict enquiry, all the true kinds.

COMPOUND FOS SILS.

ORDER XI.

FLINT S.

Opake, glossy, solid, and of one colour and substance.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
1. CHALK FLINT.							
Uneven masses	very hard	heavy	rough, white coated	DUSKY	horn-like	chalk-pits	Silex Cretacus. L. gun flints, and glafs.
2. OIL FLINT.							
Great lumps	hard	heavy	naked, and smooth	OLIVE- COLOUR'D	oily	France	Silex Pyromachus. L. gun flints.
3. GREY FLINT.							
Vast lumps	very hard	heavy	smooth, brown coated	GREY	glossy	Sweden	Silex Marmoreus. L. gun flints.

COMPOUND FOSSILS.

CLASS II.

STONES.

Formed into whole strata; composed of two, or more of the native earthy Fossils.

ORDER I.

EARTHY STONES.

Composed of hardened Earths, with Saline, or other mixtures.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. OIL STONE.							
Thick plates	soft	heavy	smooth	BLACK	fine	Germany	* Schifus Novacula. L. for whetstones.
2. SLATE STONE.							
Thin plates	hard	heavy	scaly	RAVEN GREY	easily mark'd	Germany	Schifus Tabularis. L. plates for writing.
3. BRITTLE SLATE.							
Thick plates	tender	light	duffy	BLACK	crumbly	Sweden	Schifus Atratus. L.
4. GREEN SLATE.							
Coarse plates	soft	heavy	rugged	GREYISH GREEN	brittle	Germany	Schifus Viridis. L.

5. BLUE SLATE.

Fine plates	hard	heavy	even	BLUE GREY	firm	England	Schistus Ardesia, L. for slating houses.
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6. PURPLE SLATE.

Thick plates	hard	light	scaly	PURPLE	brittle	England	Schistus Purpurascens, H. for houses.
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7. SOUNDING SLATE.

Fine plates	very hard	heavy	smooth	BLACK	sounds when struck	England	Schistus Solidus, L. for houses.
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8. CLAY SLATE.

Thick strata	soft	light	rugged	YELLOWISH GREY	crumbly	Sweden	Schistus Argillaceus, L.
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• Excellent Linnæus! so distinct and perfect in these Stones, little remains for others, but to copy him!

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USE.
9. WHITE MARLE SLATE.							
Vast strata	very soft	light	scaly	PURE WHITE	shattery	England	manure. Schistus Albus. H.
10. GREY MARLE SLATE.							
Thick beds	soft	heavy	uneven	DEAD GREY	crumbly	England	manure. Schistus Margaceus. a L.
11. GREEN MARLE SLATE.							
Deep strata	hard	heavy	rugged	GREENISH	breaks in the air	England	manure. Schistus {Margaceus. β L.
112. RUDDY MARLE SLATE.							
Thick strata	very hard	heavy	scaly	REDDISH	breaks in the air	England	manure. Schistus Margaceus. γ L.

13. STAINING SLATE.		light	flaky	DEEP BLACK	stains the hands	Sweden	a coarse paint.	Schistus Nigricans.
14. RAVEN SLATE. ALUM SLATE.								Schistus Communis. L.
Thick strata	hard	heavy	scaly	RAVEN GREY	firm	England	alum ore.	Schistus Olearius. L.
Thick strata	hard	heavy	rugged	RUDDY	brown spots	Sweden	whetstones.	Schistus Effervescens. L.
Vast strata	hard	heavy	scaly	PALE BROWN	gritty	Sweden	lime.	Schistus Compactissimus. L.
Thick plates	very hard	very heavy	flaky	DARK GREY	compact	China		

• This often is rich in Alum; in which case it breaks into a kind of rhomboidal fragments, with sparkling surface.

COMPOUND FOSSILS.

O R D E R II.

CRYSTALLINE STONES.

Composed of a crystalline matter ; debased by earthy, and other mixtures.

THE distinction of these Stones is easy, and absolute : they are hard ; they are glossy, when broken ; they strike fire with steel ; they are not affected by Acids ; and they run to glass.

Where we see cracks, or hollows, in them, they are usually lined, or filled with shoots of pure Crystal ; and of Crystal only. Spar has no place but in Sparry Stones.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. GRINDSTONE.							
Thick strata	hard	heavy	rugged	WHITISH	sandy	Germany	^{Cos} Cotaria. L. for grindstones.
2. CRACKSTONE.							
Vast strata	soft	heavy	crack'd	GREYISH	spangled	Sweden	^{Cos} Quadrant. L.
3. LIVERSTONE.							
Vast masses	tender	heavy	rugged	REDDISH BROWN	bounces in the fire	Sweden	^{Cos} Calcare. L.
4. TYGERSTONE.							
Great masses	hard	heavy	uneven	RUDDY BROWN	white spots	Sweden	^{Cos} Tigra. L.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
5. IRON STONE.							
Rude lumps	soft	lighter	bubbly	PALE BROWN	round rusty spots	Germany	^{Cos Variolosa. L.} an iron ore.
6. HONE STONE.							
Flat lumps	soft	heavy	smooth	PALE YELLOWISH BROWN	smooth	Arabia	^{Cos Novacula. L.} for barbers hones.
7. WHITE SLATE STONE.							
Flat flakes	hard	heavy	rugged	WHITISH	sandy	England	^{Cos Fissilis. L.} for building.
8. RED SLATE STONE.							
Thick plates	tender	very heavy	scaly	REDDISH	gritty, sparkling	England	^{Cos Fissilis Rufescens. L.} for building.

9. CRUMBLY STONE.

Vaſt ſtrata

ſoft

heavy

PALE

hardens in
the air

England

building.

Friab.
L.

10. LOOSE STONE.

Great lumps

brittle

heavy

gritty

BRIGHT

of ſmall,
clear
granules

Italy

glafs.

Cos
Coagmentata.
L.

11. FILTERING STONE.

Thick lumps

tender

light

cavernous

PALE
BROWNlets water
paſs thro'

Canaries

for filtering water.

Cos
Filtrum.
L.

12. SMOOTH STONE.

Thick ſtrata

very hard

heavy

ſmooth

YELLOWISH
BROWNgranite
dotsGermany,
Sweden

grinding ſtones.

Cos
Compacta.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
13. BRIGHT STONE.							
Vast strata	hard	heavy	regularly granulated	PALE BROWN	bright	England, Sweden	building.
14. YELLOW SANDSTONE.							
Great strata	tender	heavy	sandy	YELLOW	even structure	Yorkshire	
15. GREEN SANDSTONE.							
Vast masses	soft	very heavy	rudded	DULL GREEN	granulated	Germany	refuse.
16. BLACK SANDSTONE.							
Great lumps	tender	heavy	uneven	BLACKISH	coarse	Sweden	refuse.

Cos
Stratonia.
L.Cos
Colorata.
a L.Cos
Colorata.
β L.Cos
Colorata.
γ L.

17. PORCELANE STONE.

Thick strata

hard

heavy

irregular

GREY

part
glossy

Sweden

Cos
Porcellana,
L.

18. MILL STONE.

Vast strata

hard

heavy

irregular

PALE
BROWN

mixt of
various
particles

England

for grinding corn.

Cos
Molaris,
L.

19. ROUGH STONE.

Vast strata

very hard

heavy

granulated

RUDDY

sharp
particles

Sweden

Cos
Fundamentalis,
L.

building.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
20. WHITE STONE.							
Vast strata	hard	heavy	rough	WHITISH	sharp particles	England	building. Cos Fundamentalis Alba. L.
21. PLATE STONE.							
Great lumps	very hard	heavy	smooth	PALE GREY	flinty, but gra- nulated	Germany	glass. Quartzum Fissile. L.
22. SLAG STONE.							
Vast blocks	hard	very heavy	rugged	PALE BROWN	mixture of great and small grains	Sweden	glass. Quartzum Cotacum. L.

COMPOUND FOSSILS.

ORDER III.

SPARRY STONES.

Composed of Spar ; debased by earthy, and other mixtures.

THESE are soft, tender, and brittle ; they break irregularly ; they will not strike fire with steel ; and they ferment with Acids. The pure Spar in their construction, dissolves in these liquors ; and sometimes part of the debasing mixture, when Alkaline : the rest remains, and shews the mixt nature of the Stones.

'Tis from these residuums of the various Sparry Stones, washed clean, and examined by the microscope, we may, with truth and certainty, discover their nature and composition.

The cracks in these rocks always afford Spar, never Crystal ; therefore these crystalizations are of matter which was originally a part of the Stone itself, not brought from elsewhere.

The coarser Sparry Stones have been called, Limestone ; and the finer Marbles. The distinctive names shall be preserved here, tho' the distinction itself is vague. I have had some of our Limestones polished, as Marble, which all have call'd, and allowed to be Marble ; and many Marbles always called so, and acknowledged such, are burnt into lime ; especially the fragments, and the upper parts of the strata.

In all Limestones, Marbles, and even in Chalk, the upper part is softer, and coarser ; that which lies deeper, is harder, and finer.

COMPOUND FOSSILS.

I. LIMESTONES.*

Sparry Stones of a dull aspect.

I. OF A SMOOTH EVEN STRUCTURE.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USE S.
1. WHITE SMOOTH LIMESTONE.							
Great strata	tender	heavy	uneven	WHITISH	burns easily to lime	England	lime. manure.
2. YELLOW SMOOTH LIMESTONE.							
Vast masses	hard	heavy	smooth	PALE YELLOW	burns slowly	Venice	lime.

Lapis Calcareus
Æquabilis Albus.
W.

Calcareus Æ.
Flavus
Cronstedt.

3. RUDDY SMOOTH LIMESTONE.

Thick strata	tender	light	rough	REDDISH BROWN	brittle	Sweden	lime.	Calcareus $\mathcal{A}$. Rubens. W.
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4. RUSTY SMOOTH LIMESTONE.

Thin strata	hard	heavy	flaky	RUST COLOUR'D	glossy	Germany	lime.	Calcareus Ferrugineus Cronstedt.
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H h 2 5. GREY SMOOTH LIMESTONE.

Vast masses	hard	light	rugged	BLUEISH GREY	firm	England	lime. manure.	Calcareus Griseus Cronstedt.
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6. GREEN SMOOTH LIMESTONE.

Thick strata	very hard	heavy	irregular	GREENISH	burns quick	Prague	lime.	Calcareus $\mathcal{A}$. Viridis. W.
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* Here Cronstedt takes the lead, as Linnaeus did in the preceding Order of the Crystalline Stones; the great Swede, not allowing the mineralists distinction, as of Species, but accounting them Varieties. 'Tis thus the Student in this abstruse science should act, always selecting the names of that author, who has been most distinctive; and adding, and reforming from his own store.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
7. IRON SMOOTH LIMESTONE.							
Large strata	very hard	very heavy	undulated	GLOSSY, IRON GREY	burns slowly	Germany	lime. Calcareus <i>Æ.</i> Fereus. W.
8. BROWN SMOOTH LIMESTONE.							
Great lumps	hard	heavy	rugged	DEEP BROWN	burns difficultly	Dalecarlia	lime. Calcareus <i>Æ.</i> Fuscus. W.
9. BLACK SMOOTH LIMESTONE.							
Vast strata	soft	light	smooth	BLACKISH	burns easily	Germany	lime. Calcareus Niger Cronstedt.
10. MARBLED SMOOTH LIMESTONE.							
Thick strata	very hard	heavy	flaky	grey, ruddy, and other colours, mixed	bright	Germany	lime. Calcareus <i>Æ.</i> Venosus. W.

2. GRITTY LIMESTONES.

11. COARSE WHITE GRITTY LIMESTONE.

Vast strata

tender

light

granulated

DEAD
WHITElarge
grains

England

Calcareus Granulatus
Alb. 1.
Cronstedt.lime.
manure.

12. FINE WHITE GRITTY LIMESTONE.

Great lumps

hard

heavy

rough

BRIGHT
WHITEsmall
grains

Sweden

Calcareus Granulatus
Alb. 2.
Cronstedt.

lime.

13. BRIGHT GRITTY LIMESTONE.

Irregular
strata

brittle

light

dusty

sulphure-
ous smell

Italy

Calcareus
Scintillans
Cronstedt.

for brimstone.

14. RED GRITTY LIMESTONE.

Thick strata

hard

heavy

rugged

REDDISH

crackly

England

Calcareus Granulatus
Ruber
Cronstedt.

lime.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
3. FLAKY LIMESTONE S.							
15. GREEN GRITTY LIMESTONE.							
Thin strata	tender	light	irregular	DARK GREEN	burns easily	Germany	lime.
16. BLACK AND WHITE GRITTY LIMESTONE.							
Thick beds	hard	heavy	undulated	MARBLED, OF BLACK, WHITE, AND BROWN	burns slowly	Salberg	lime.
17. GREEN AND WHITE GRITTY LIMESTONE.							
Rude lumps	tender	heavy	rudd	WHITE, AND GREEN	blotch'd	Salberg	lime.
18. WHITE FLAKY LIMESTONE.							
Vast masses	hard	light	rudd	SNOW WHITE	thick plates	Sweden	lime.

Calcareus Granulatus
Viridescens.
W.

Calcareus Granulatus
Nigro Albescens
Cronstedt.

Calcareus Granulatus
Albo Viridis
Cronstedt.

Calcareus Squammosus
Albus
Cronstedt.

19. GREY FLAKY LIMESTONE.	Thin strata	tender	heavy	smooth	DUSKY GREY	coarse scales	Germany	lime.	Calcareus Squamifolius Griffiths Cronstedt.
20. SILVERY FLAKY LIMESTONE.	Small lumps	very hard	heavy	polished	PURE WHITE	close, small scales	Sweden	lime.	Calcareus Albus Dalmanensis Cronstedt.
21. RED FLAKY LIMESTONE.	Great strata	tender	very heavy	uneven	RUDDY	large scales	Germany	lime.	Calcareus Ruber Cronstedt.
22. CLOUDED FLAKY LIMESTONE.	Thick strata	hard	heavy	rough	GREY, RED, AND WHITE	small scales	Sweden	lime.	Calcareus Variegatus Cronstedt.

If there can be a distinction between Limestone, and Marble, this twenty-second kind is the connecting link: 'tis either the coarsest of the Marbles, or the finest of the Limestones.

COMPOUND FOS SILS.

2. M A R B L E S.

Sparry Stones, bright, and glittering.

I. O F O N E C O L O U R.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	C O L O U R.	QUALITIES.	P L A C E.	U S E S.
I. P A R I A N M A R B L E.							
Vaſt blocks	tender	heavy	wrinkled	PURE WHITE	glittering	Paros	Marmor Nobile Album. L. for ſtatues.
2. C A R R A R A M A R B L E.							
Great maſſes	hard	heavy	ſmooth	GOOD WHITE	clear	Italy	Marmor Lunenſe. H. ſtatues.

3. GREY MARBLE.

Thick strata very hard

heavy

irregular

DUSKY
GREYfinells like
horn,
when
burnt

Hildesheim

ornaments.

Marmor
Palumbinum.
W.

4. YELLOW MARBLE.

Vast strata

very hard

heavy

rugged

PALE
YELLOW

sparkling

Italy

ornaments.

Marmor
Terebinthinatum
Catalp.

5. RED MARBLE.

Great blocks

hard

heavy

irregular

DULL RED

opaque

Italy

ornament.

Marmor
Rufum.
L.

6. BLUE MARBLE.

Thick beds

very hard

very
heavy

wrinkled

DUSKY
BLUEhigh
polish

Spain

monuments.

Marmor
Numidium.
H.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
7. GREEN MARBLE.							
Broken strata	tender	light	smooth	GREEN	cloudy	England	Marmor Lacedemonium. H. ornaments.
8. SPARKLING BLACK MARBLE.							
Vast strata	very hard	heavy	granulated	BRIGHT BLACK	glittering	Italy	Marmor Leculleum. H. for tombs.
9. DULL BLACK MARBLE.							
Great blocks	tender	very heavy	smooth	DEAD BLACK	a touch- stone	Italy	Marmor Chium. H. monuments.
10. BROWN MARBLE.							
Thick strata	soft	light	irregular	UMBER- COLOUR	dull	Italy	Marmor Lividum. W. ornaments.

2. SHELLY MARBLES.

11. GREY SHELLY MARBLE.

Vaſt ſtrata

tender

heavy

wrinkled

WHITE

grey
veins, and
ſmall
ſhells

Italy

chimney-pieces.

Marmor
Venofum
Albam Agric.

12. GREY ENTROCHINE MARBLE.

Immenſe
blocks

hard

heavy

moſt
irregular

GREY

fossil, en-
trochi,
and ſhells

Derbyſhire

chimnies.

Marmor
Derbient.
H.

13. GREEN SHELLY MARBLE.

Great beds

tender

very
heavy

uneven

DULL
GREENſhells with
white
ſpar

Bohemia

ornaments.

Marmor
Vireſcens.
H.

14. GREY GREEN SHELLY MARBLE.

Deep ſtrata

tender

light

rugged

GREYISH
GREENblack and
white
ſhells

Suſſex

ornaments.

Marmor
Cinereovirens.
H.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
15. BLACK SHELLY MARBLE.							
Great blocks	hard	heavy	rumpled	DEEP BLACK	white shells	Ireland	Marmor Nigrinum. H. tombs.
16. BLACK CORALLOIDE MARBLE.							
Thick strata	hard	very heavy	uneven	GREYISH BLACK	feathery coralloides	Derbyshire	Marmor Coralliticum. H. ornaments.
3. V A R I E G A T E D M A R B L E S.							
17. WHITE AND GREY MARBLE.							
Vast strata	tender	heavy	irregular	GOOD WHITE	blueish grey veins	Italy	Marmor Alboceruleum. H. ornaments.
18. PURPLE AND WHITE MARBLE.							
Deep strata	hard	very heavy	cracked	WHITE, AND PURPLE	blotch'd	Italy	Marmor Albopurpureum. H. ornaments.

19. BROWN AND WHITE MARBLE.	Thick strata	soft	light	smooth	BROWN, AND WHITE	blotches. scratch'd by a pin	Italy	Marmor Albocufcum. H.	ornaments.
20. RED AND WHITE MARBLE.	Vaft strata	very hard	very heavy	irregular	PALE RED, AND WHITE	veined	Italy	Marmor Alborubefcens. H.	chimney-pieces.
21. BLUE AND WHITE MARBLE.	Great strata	soft	light	rugged	BLUEISH, AND WHITE	in blotches	Italy	Marmor Alboceruleum. H.	ornaments.
22. BROWN RED AND WHITE MARBLE.	Great blocks	hard	heavy	irregular	THREE-COLOUR'D	veins and blotches	Italy	Marmor Pallidofufcum. V. H.	ornament.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
23. BROWN BLACK AND WHITE MARBLE.							
Great strata	tender	heavy	crack'd	THREE-COLOUR'D	veins and blotches	Italy	Marmor Fuscum Nigrovariegatum. H. ornaments.
24. BROWN AND WHITE MARBLE.							
Great blocks	very hard	very heavy	smooth	BROWN	white blotches	Italy	Marmor Fusco- albidum. H. ornaments.
25. SYENNA MARBLE.							
Vast blocks	tender	heavy	shattery	YELLOW, WITH	purple spots and blotches	Italy	Marmor Flavopurpureum. H. ornaments.
26. AFRICAN MARBLE.							
Great strata	hard	very heavy	irregular	YELLOW, WITH	deep blue spots	Africa, and Spain	Marmor Flavoceruleum. H. chimney-pieces.

27. BROCATELLO MARBLE.	Thin strata	tender	very heavy	undulated	DEEP YELLOW, WITH	red and white veins	Spain	ornaments.	Marmor Portuſanſe. W. Marmor Nigro- album. H.
28. BLACK AND WHITE MARBLE.	Vaſt ſtrata	very hard	heavy	rugged	BLACK, WITH	narrow white veins	Italy	tombs.	Marmor Nigro- luteum. H.
29. BLACK AND GOLD MARBLE.	Thick ſtrata	hard	very heavy	irregular	FINE BLACK	yellow veins	Italy	ornaments.	Marmor Nigro- rubens. H.
30. BLACK AND RED MARBLE.	Great blocks	hard	heavy	ſmooth	GOOD BLACK	red and white veins	Ireland	chimney-pieces.	

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
31. BLACK BROCADE MARBLE.							
Thick strata	tender	heavy	rugged	FINE BLACK	red, white, and yellow veins	Derbyshire	Marmor Nigrum Variegatum. H. ornaments.
32. AUGUSTAN MARBLE.							
Thick masses	firm	very heavy	rugged	LIGHT GREEN	white veins and talc	Ægypt	Marmor Viride Album. H. ornaments.
33. BLACK SERPENTINE MARBLE.							
Great lumps	hard	heavy	irregular	DEEP GREEN	black and white spots	Africa	Marmor Ophites Nigrit. H. ornaments.
34. WHITE SERPENTINE MARBLE.							
Great lumps	soft	light	rugged	LIGHT GREEN	white, and some black spots	Ægypt	Marmor Ophites Album. H. ornaments.

35. GREY AND BLACK MARBLE.

Large masses very hard heavy

ASHY
GREY

irregular

black
spots

Africa

Marmor Ophites
Cinereus.
H.

ornaments.

36. ARABIAN MARBLE.

Great lumps hard heavy

BROWNISH
GREY

undulated

oblong,
green
spots

Arabia

Marmor Fulco-
virens.
H.

ornaments.

37. GREEN VEIN'D MARBLE.

Large masses hard very heavy

LIGHT
GREY

irregular

green
veins, and
spots

Germany,
Cornwall

Marmor Cinereo-
virens.
H.

ornaments.

38. RED AND GOLD MARBLE.

Great strata hard heavy

GOOD
RED

rugged

gold and
white
veins

Italy

Marmor
Thebaicum.
H.

ornaments.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
39. ONYX MARBLE.							
Small masses	hard	light	in broken beds	BROWN	blue, black, white, in beds	Germany	Marmor Polyzoniss. W. snuff-boxes.
40. FLORENTINE MARBLE.							
Great masses	tender	heavy	rugged	YELLOWISH BROWN	rude figures in black	Italy, Arabia	Marmor Florentinum. L. ornaments.
41. DENDRITE MARBLE.							
Great lumps	hard	heavy	rough	PALE BROWN	mocoa figures in black	Hesse	Marmor Hassiacum. W. ornaments.
4. DEBASED MARBLE.							
42. SLATE MARBLE.							
Thick strata	tender	heavy	plated	WHITISH YELLOW	filile	Germany	Marmor Filile. L. ornaments.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
47. SANDY MARBLE.							
Great strata	soft	heavy	irregular	BROWNISH WHITE	full of sand and clay	France	building. Marmor Scillite L.

S T O N E S.

O R D E R IV.

C O N C R E T E S.

Composed of various matters, rudely mixt together.

I. P O R P H Y R Y S.

Composed of Jasper, Crystal, and Shirl.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
1. PURPLE AND WHITE PORPHYRY.							
Vast rocks	very hard	very heavy	rugged	DEEP PURPLE	small white specks	Ægypt	Saxum Porphyrius γ. L. ornaments.
2. BROWN RED AND WHITE PORPHYRY.							
Great rocks	very hard	heavy	granulated	DEEP BROWN	purple and white spots	Sweden	Saxum Porphyrius. L. ornaments.
3. BLACK AND RED PORPHYRY.							
Thick strata	very hard	heavy	irregular	BLACKISH	spots of deep red	Arabia	Saxum Porphyrius α. L. ornaments.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
4. BLACK RED AND WHITE PORPHYRY.							
Vast blocks	very hard	heavy	ragged	DEEP BLACK	spots of red and white	Ægypt	Saxum Porphyrius <i>S.</i> L. ornament.
5. GRAY AND BLACK PORPHYRY.							
Great masses	very hard	heavy	uneven	RAVEN GREY	spots of deep black	Syria	Saxum Porphyrius <i>S.</i> L. ornaments.
6. GREEN AND WHITE PORPHYRY.							
Vast rocks	very hard	heavy	rudd	PALE GREEN	white spots	Germany	Saxum Porphyrius <i>S.</i> L. ornaments.
7. MINORCAN PORPHYRY.							
Great masses	most hard	very heavy	granulated	BRIGHT RED	green, white, and black spots	island of Minorca	Porphyrius Minorceus. H. worthy the first uses.

8. ROSE PORPHYRY.

Vast blocks | very hard | heavy

9. GREY AND WHITE PORPHYRY.

Rounded lumps | hard | heavy

2.

G R A N I T E S.

Composed of Jasper, Crystal, and Talc.

1. RED AND BLACK GRANITE.

Immense rocks | very hard | heavy

2. BLACK RED AND WHITE GRANITE.

Vast rocks | most hard | heavy

black, green, white spots

ROSE COLOUR

most rugged

white spots

DARK GREY

very smooth

black spots

FINE RED

rugged

white spots

MIXT BLACK AND RED

irregular

Porphyryus Carneus. H.
for ornaments.

Porphyryus Griseus Croastet.
for ornaments.

Granita Rubra. H.
ornaments.

Granites Pyropacilote. H.

obelisks.

upper Egypt

Sweden

Ægypt

Arabia

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
3. GREEN RED AND WHITE GRANITE.							
Great masses	hard	heavy	rugged	GREEN AND RED	white spots	China	Saxum Granites Chinense. L. ornaments.
4. MOORSTONE GRANITE.							
Great lumps	very hard	heavy	most rugged	WHITE	black spots	Cornwall	Granita Albo- nigra. H. curbs and steps in building.
5. GOLDEN GRANITE.							
Great lumps	hard	heavy	rugged	FLESH COLOUR'D	white, black, and gold spots	Minorca	Granites Lutconiger. H. fit for the best uses.
6. LOOSE GRANITE.							
Crumbly masses	harsh	heavy	irregular	RUDDY	white and black spots	Sweden	Granites Frischlie Confecte. for melting furnaces.

3. TRAPPESTONES.

Composed of Jasper, Clay, and Slate; with some Iron.

1. GREY CHAFFY TRAPESTONE.

Flat cakes	hard	heavy
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2. BLACKISH CHAFFY TRAPESTONE.

Vast rocks	hard	very heavy
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3. ASHY SAND TRAPESTONE.

Thick strata	brittle	heavy
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4. BROWN TRAPESTONE.

Wholerocks	hard	heavy
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RAVEN
GREYspotted
whitish

Sweden

Trapiskiol
Grisea
Cronstedt.
glass bottles.

BLACK

blackier
spots

Delarne

Trapiskiol
Nigra
Cronstedt.ASH
COLOUR'Ddark
spots

Sweden

Trapiskiol
Chinera
Cronstedt.

bottles.

DEEP
BROWNwhitish
specks

Sweden

Trapiskiol
Fusca
Cronstedt.

bottles.

FOR M.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
5. RUDDY TRAPESTONE.							
Serpentine veins	very hard	very heavy	coarse, and rough	RUDDY	brown spots	Norway	Trafskiol Rufa Cronstedt. coarse glaſs.
6. WHITISH TRAPESTONE.							
Vaſt ſtrata	tender	heavy	ſmooth	WHITISH	white ſpecks	faintly ſtriated	Trafskiol Sorberkenſis Cronſtedt glaſs.
7. BLUE TRAPESTONE.							
Rocks	hard	very heavy	even	DEAD BLUEISH	unſpotted	uniform	Trafskiol Caruleſcens Cronſtedt. good glaſs.
8. BLACK FINE TRAPESTONE.							
Veins in rocks	hard	heavy	ſmooth	DEEP BLACK	unſpotted	cloſe	Trafskiol Nigra Cronſtedt. touchſtone.

The Trapeſtones have all a tendency to ſplit-like Slate; and to break into a kind of large dice, when ſtrattered by a perpendicular blow: they do not always form whole rocks; but make thick veins in their uneven cracks. They are uſually found with various mixtures, and all contain ſome iron.

STONES.

ORDER V. QUARRY STONES.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. LAPLAND QUARRY STONE.							
Rocks	hard	heavy	raised in small lumps	REDDISH	white spots.	Lapland	Sarum Laponicum. L.
28. DANNEMORE QUARRY STONE.							
Thick strata	very hard	heavy	irregular	BLUEISH	transparent, in thin pieces	Dannemore	Saxum Dannemoreense. L. a poor iron ore.

* In regard to these Stones, no author is so excellent as Linnæus: himself has examined them in Sweden; and all his distinctions may be depended on: Twere well if the Stones of other countries had been so observ'd; but these run thro' all the north.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
3. SAHLBERG QUARRY STONE.							
Rocks	tender	heavy	uneven	GREY	coarse granulated	Sahlberg	lime.
4. ITALIAN QUARRY STONE.							
Thick strata	soft	heavy	plated	PALE BROWN	scaly, with talc	Italy	in buildings.
5. CAPE QUARRY STONE.							
Great masses	tender	light	granulated	GREY	small black spots	island of St. Helena	lime.
6. MOUNTAIN QUARRY STONE.							
Thick strata	very hard	heavy	wav'd	PALE BLUEISH GREY	small white spots	tops of Lap-land mountains	glafs.

Saxum
Sahlbergense.
L.

Saxum
Talcolum.
L.

Saxum
Helense.
L.

Saxum
Æthereum.
L.

7. WAVY QUARRY STONE.

Rocks

hard

heavy

spangled
with talc

RUDDY
BROWN

undulated

Sweden

building.

Saxum
Undulatum.
L.

8. RADIANT QUARRY STONE.

A vast rock

hard

heavy

rays of
black and
purple
garnets

PALE
BROWN

rugged

Germany

building.

Saxum
Radiant.

9. FAHLUN QUARRY STONE.

Vast strata

tender

heavy

white
specks

RUDDY
BROWN

granulated

Fahlun

building.

Saxum
Fahlunense.
L.

10. PEARLY QUARRY STONE.

Thick strata

hard

heavy

coarsely
granulated

WHITISH

white
specks

Nericia

building.

Saxum
Margaritaceum.
L.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
II. WHETTING QUARRY STONE.							
Thin strata	tender	heavy	streaky	REDDISH WHITE	striated	Scania	Saxum Novaculare, L. whetstones.
12. STENSHUWHEED QUARRY STONE.							
Thick strata	soft	light	scaly	YELLOWISH BROWN	flaky	Sweden	Saxum Stenonit, L. whetstones.
13. MORANE QUARRY STONE.							
Thick strata	hard	light	rugged	REDDISH BROWN	transpa- rent specks	Sweden	Saxum Morane, L. building.
14. BLACK LIN'D QUARRY STONE.							
Great rocks	very hard	heavy	uneven	RUST COLOUR'D	black streaks	Sweden	Saxum Decussatum, L. buildings.

17. CORN STONE.

Thick strata

tender

light

wav'd

PALE
BROWNoblong
specks

Germany

buildings.

Saxum
Frumentale.
L.

16. MIXT QUARRY STONE.

Vast strata

hard

heavy

rugged

WHITISH

black, fil-
very, and
red spots

Sweden

for mill stones.

Saxum
Molare.
L.

17. GARPENBERG STONE.

Great strata

hard

heavy

granulated

WHITISH

with small
white talc

Garpenberg

buildings.

Saxum
Garbergense.
L.

18. BLUE GREEN QUARRY STONE.

Thick strata

tender

light

flaky

BLUEISH
GREENgreenest
wet

Smoland

furnaces.

Saxum
Caruleum.
L.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
19. SALT QUARRY STONE.							
Great rocks	tender	heavy	flaky	BROWN	spangled, crumbles in air	Sweden	Saxum Faticent. L. for nitre.
20. ALPINE QUARRY STONE.							
Thick strata	shattery	heavy	irregular	PALE BROWN	with talc and granites	Norway	Saxum Alpinum. L. buildings.
21. GRANITE QUARRY STONE.							
Wet rocks	hard	heavy	rugged	BLACK	with brown granites and talc	Sweden	Saxum Granatum. L. buildings.
22. ROSE QUARRY STONE.							
Thick strata	very hard	heavy	raised in lumps	PALE RED	white and talcy spots	Sweden	Saxum Triorium. L. mill stones.

23. NORWAY QUARRY STONE.

Vaft rocks

hard

heavy

plated

BLACK AND
WHITE

fiffle

Norway

building.

24. GOLDEN QUARRY STONE.

Whole
mountains

tender

light

irregular

PALE
BROWNspangles
of yellow
talc

Sweden

buildings.

25. MARESTRA AND QUARRY STONE.

Vaft strata

tender

light

uneven,
and
plated

WHITISH

small
white
spangles

Sweden

buildings.

26. RUDDY QUARRY STONE.

Thick beds

hard

heavy

plated

REDDISH

red gar-
nets and
white
spangles

Sweden

buildings.]

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
27. BITSBERG QUARRY STONE. Great rocks	hard	heavy	freaky	BLACK	longish black specks	Sweden	Saxum Bitsbergense. L. buildings.
28. METALLINE QUARRY STONE. Thick strata	very hard	heavy	smooth	ASH COLOUR'D	white specks and spangles	Sweden	Saxum Metalliferum. L. mother of ores.
29. SIBERIAN QUARRY STONE. Great masses	very hard	heavy	smooth	RED	white spots	Siberia	Saxum Sibericum. buildings.
30. ANGERSMAN QUARRY STONE. Thin strata	hard	heavy	rudd	WHITISH	full of black talc	Sweden	Saxum Angersmanense. L. buildings.

31. NORBERG QUARRY STONE.

Vast beds hard very heavy

irregular

white spots

Norberg

mother of iron ore.

Saxum
Norbergense.
L.

32. FURNACE QUARRY STONE.

Great strata slaty heavy

plated

GREY

white and talcy spots

Sweden

for furnaces.

Saxum
Fornaceum.
L.

33. WHETTING STONE.

Oblong tender heavy

flaky

DEEP BROWN

like fossil wood

Cologn

for whetstones.

Saxum
Cotrasium.
L.

34. ANTIENT QUARRY STONE.

Vast rocks hard heavy

granulated

DARK GREY

talcy and bright spots

Sweden

furnaces.

Saxum
Grandevant.
L.

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FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
35. RINGING QUARRY STONE.							
Great rocks	very hard	heavy	smooth	IRON GREY, WITH SMALL GARNETS	rings, when struck	Sweden	^{Saxum} Tintianus. L. buildings.
36. CLAY QUARRY STONE.							
Thick strata	hard	heavy	smooth	YELLOWISH BROWN	like hard clay	Sweden, England	^{Saxum} Primigenium. L. coarse buildings.
37. PALE QUARRY STONE.							
Great strata	tender	light	rough	WHITISH BROWN	coarse	Northamp- tonshire	^{Pisidium} Fragile. H. buildings.
38. BRIGHT QUARRY STONE.							
Thick strata	hard	heavy	uneven	WHITISH	fine	Dorsetshire	^{Pisidium} Dorset. H. buildings.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
43. SPUNGY QUARRY STONE. Great rocks	very hard	heavy	uneven	PALE GREY	porous	Yorkshire	Sympexium Porosum. H. in buildings.
44. STRAW COLOUR'D QUARRY STONE. Thick strata	hard	very heavy	irregular	VERY PALE YELLOW	deeper yellow veins	Dorsetshire	Sympexium Albido- flavescens. H. in buildings.
45. LEAD COLOUR'D QUARRY STONE. Thick strata	very hard	heavy	smooth	DULL BLUEISH	perfectly even, like flint	Northamp- tonshire	Sympexium Subcreruleum. H. in buildings.

46. VARIEGATED QUARRY STONES.

Thin strata

tender

heavy

irregular

DUSKY
REDblotches
of green

Derbyshire

coarse buildings.

* These are the Stones of England, differing from the Swedish : five and twenty-years since, I examined, one by one, the Quarry-Stones of this Kingdom, in the same manner in which the excellent Linnæus has lately gone through those of Sweden. I hope those who study Fossils in other countries, will follow the same method; for there is no other: and the subject is worthy all attention.

S T O N E

E S.

O R D E R.

A G G R E G A T E S.

Formed of various Fossil matters, connecting, coating, or concreted with one another.

I. CONNECTING PUDDING STONES.

A pebbly matter cementing together various pebbles.

* Sympetium Rubro-
virens.
H.

very beppia. mntel cementing together azione beppes.

CONCRETE LADDING STONES

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. PALE PUDDING STONE.							
Great lumps	very hard	heavy	full of lumps	CREAM COLOUR'D	various pebbles	Hertfordshire	for snuff-boxes.
2. GREY PUDDING STONE.							
Large masses	hard	heavy	rude	BRIGHT GREY	large pebbles	Hertfordshire	snuff-boxes.
3. RED PUDDING STONE.							
Large lumps	hard	heavy	rugged	RED	small pebbles	Lincolnshire	ornaments.
4. BROWN PUDDING STONE.							
Great lumps	soft	heavy	irregular	DULL BROWN	filled with various pebbles	Leicestershire	boxes.

Lithosugium Albo-Flavicans. H.

Lithosugium Albogriseum. H.

Lithosugium Rubescens. H.

Lithosugium Fuscum. H.

3. COARSE RED PUDDING STONE.

Vast lumps

soft

heavy

rude

DULL RED

red,
crystalline
lumps

Yorkshire

coarse buildings.

Lithozugium Impurius
Rubescens.
H.

6. COARSE BLUE PUDDING STONE.

Vast masses

hard

heavy

rugged

BLUEISH

with
white
lumps

Leicester-
shire

pavements.

Lithozugium Impurius
Ceruleus.
H.

7. COARSE GREENISH PUDDING STONE.

Rounded
nodules

very hard

heavy

rugged

GREEN

with co-
lourless
lumps

Minorca,
England

fit for fine works.

Lithozugium Albo-
viridis.
H.

8. COARSE VEINY PUDDING STONE.

Great lumps

soft

heavy

rugged

PALE RED

white
veins and
lumps

Scarborough

coarse buildings.

Lithozugium Impurius
Venosum.
H.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
9. OCHREOUS PUDDING STONE.							
Great lumps	hard	very heavy	rude and irregular	YELLOWISH BROWN	full of pebbles and sand	Sweden	Saxum Amnigenum. L. coarse furnaces.
10. SHELLY PUDDING STONE.							
Irregular masses	soft	heavy	rugged	TAWNY	full of shells, sand, and pebbles	Sweden	Tophus Marinus. L. an iron ore.
11. SANDY PUDDING STONE.							
Thin beds	soft	heavy	uneven	YELLOW	full of large sand	Germany	Tophus Arenaceus. L. an iron ore.

AGGREGATE STONES.

ORDER II.

CONCRETED.

TOPHES.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. BROWN CLAY TOPHE.							
Great lumps	hard	heavy	smooth	YELLOWISH BROWN	clay-like	Essex	Tophus Argillaceus Fuscus. H. useless.
2. REDDISH CLAY TOPHE.							
Large masses	very hard	heavy	wav'd	REDDISH	stone-like	Sweden	Tophus Argillaceus. L. useless.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
3. SANDY TOPHE.							
Thin cakes	brittle	heavy	uneven	YELLOWISH	sandy	German Spa	useless. Tophus Thermalis. L.
4. WHITE STONE TOPHE.							
Great lumps	hard	heavy	smooth	WHITISH	clay-like surface	Sweden	Tophus Alba Cronstedt.
5. GREY STONE TOPHE.							
Great lumps	tender	heavy	smooth	GREY	hard on the surface	Sweden	Tophus Lodov. L.
6. GLOBE TOPHE.							
Round lumps	hard	heavy	dusty	YELLOW	sandy	clay pits	Tophus Globus. L.

7. SULPHUR TOPHE.

Tophus
Sulphureus.
L.

Thick cakes

tender

light

dusty

GREY

burns like
brimstonemineral
waters

8. ALUM TOPHE.

Tophus
Aluminarius.
L.

Thick lumps

soft

heavy

irregular

GREYISH
BROWN

compact

alum works

9. BONE TOPHE.

Tophus
Osteocollus.Hollow
pieces

tender

light

uneven

WHITE

bone-like

Germany

a medicine.

A G G R E G A T E S.

ORDER III.

COATING.

CRUSTATED BODIES.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. ROOT CRUST.							
Oblong pieces	tender	light	rugged	RUSTY BROWN	hollow	Ireland	Tophus Petrifus. L.
2. WOOD CRUST.							
Oblong pieces	soft	heavy	rough	YELLOWISH	coated as wood	Germany	Tophus Sideroxylon. L.

Empheropyra
Levit.
H.Empheropyra
Mollion.
H.Heteropyra
Dario.
H.Geodes
Rimofa
H.

3. HARD NUCLEATE CRUST.

Oval lumps hard heavy

4. SOFT NUCLEATE CRUST.

Round lumps tender heavy

5. SOUNDING NUCLEATE CRUST.

Round lumps hard heavy

6. HARD DUSTY CRUST.

Flatted lumps hard heavy

YELLOWISH
ruddy
crusts
EnglandBROWNISH
ruddy and
greenish
crusts
EnglandYELLOWISH
rattleslike
eagle-
stone
EnglandYELLOWISH
ruddy
crusts,
dusty
within
England

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
7. SOFT DUSTY CRUST.							
Oval lumps	soft	heavy	rugged	TAWNY	purple, yellow crusts	England	Geodes Rugosa. H.
8. GREAT WATER CRUST.							
Large lumps	hard	heavy	crack'd	YELLOWISH	brown crusts, water within	England	Embryos Crassica. H.
9. SMALL WATER CRUST.							
Oval	tender	light	duffy	BROWNISH	ruddy crusts, and water	England	Embryos Tenuicra. H.
10. PEA CRUST.							
Rude lumps	soft	light	of round lumps	BROWNISH	brittle	Germany	Tophus Ooliticus. L.

11. CONIC CRUST.								Tophus Turbinatus, L.
Thick cones	tender	light	rugged	YELLOWISH BROWN	ruddy blotches	Helsenbeng		
12. ONION CRUST.								Tophus Spatofus, L.
Round balls	tender	heavy	shelly	BLACK	ragged at edges	Asia		
13. PEAR CRUST.								Tophus Cotaceus, L.
Oblong lumps	soft	heavy	tily	REDDISH YELLOW	brown crusts	Westroth- land		
14. TURN'D CRUST.								Tophus Ienticularis, L.
Oval lumps	very hard	very heavy.	scaly	DEEP BLACK	a ball of pyrites in the centre	Yorkshire		

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
15. RAGGED CRUST.							
Vast lumps	tender	heavy	ragged	YELLOWISH	slaty	Germany	Tophus Schistofus. L.

A G G R E G A T E S.

ORDER IV. HELMONTIÆ.

WAXEN VEINS.

Concreted Clay, and Spar, with cracks filled up by various matters.

I. WITH THE VEINS OF SPAR.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USE S.
1. WHITE WAXEN VEIN.							
Flatted cakes	hard	heavy	crack'd in small divisions	WHITE ON SURFACE, BROWN WITHIN	lemon-colour'd veins	river fides in Germany	Secomia Cincra. H. a medicine for the gravel.
2. BLACKISH WAXEN VEIN.							
Oval cakes	tender	heavy	large divisions	BLACKISH BROWN	white veins	Pancrafs	Secomia Fulco-nigrificans, H.
3. CLAY COLOUR'D WAXEN VEIN.							
Vaft cakes	hard	heavy	large divisions	BROWNISH YELLOW	pale yellow veins	London, clay-pits	Secomia Fulco-flavificans, H.
4. BROWN WAXEN VEIN.							
Vaft cakes	very hard	heavy	few divisions	RUSTY BROWN	brown veins	Hertfordshire	Secomia Fulco-ferruginea, H.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
5. CRUSTED WAXEN VEIN.							
Flatted masses	hard	heavy	rugged	YELLOWISH	crusted over, a nucleus	Deptford	Secomia Crustata, H.
6. IRON WAXEN VEIN.							
Flat masses	hard	heavy	few cracks	REDDISH BROWN	yellow veins	Yorkshire	Secomia Ferruginea, H.
2. WITH EARTHY VEINS.							
7. COMPACT WAXEN VEIN.							
Vast rounded cakes	very hard	heavy	numerous cracks	UMBER BROWN	white earthy veins	Leicester- shire	Gaiophragmium Fucum, H.
8. COATED WAXEN VEIN.							
Oval lumps	hard	heavy	a thin coat	PALE BROWN	reddish brown veins	Yorkshire	Gaiophragmium Ferrugineum, H.

3. WITH THE VEINS OF MUNDIC.

9. SOFT WAXEN VEIN.

Pyriticus
Mollus.
H.

Oval lumps	tender	light	porous	GREYISH BROWN	veins of mundic	Sheppey Island
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4. WITH CRYSTALLINE VEINS.

10. CRYSTALLINE WAXEN VEIN.

Diaphragmium
Ferrugineum.
H.

Flat cakes	very hard	heavy	smooth	RUSTY BROWN	bright crystalline veins	Yorkshire
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11. BLUE WAXEN VEIN.

Diaphragmium
Caruleum.
H.

Oval cakes	tender	heavy	rugged	BLUEISH	yellowish crystalline veins	Yorkshire
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5. CRUSTED WITH A NUCLEUS.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
12. LEMON WAXEN VEIN.							
Round lumps	hard	heavy	smooth	YELLOWISH BROWN	black nucleus, pale veins	Mendip	Brachyphyrenium Flavescens. H.
13. SMALL WAXEN VEIN.							
Oval balls	tender	light	rudd	BROWN	yellow veins, and earth within	Northamptonshire	Bezbaricum Minerale. H.
14. HOLLOW WAXEN VEIN.							
Turbinated balls	very hard	heavy	clay-like	GREYISH BROWN, YELLOW VEINS	a dusky hollow nucleus	Knightbridge	Brachyphyrenium Fucum. H.

N A T I V E F O S S I L S.

C L A S S I X.

S A L T S.

Soluble in water; and acrid to the taste.

O R D E R I.

A C I D S A L T S.

Sour to the taste, and corrosive; dissolving many bodies.

G E N U S I.

N I T R E.

A Prism of six sides, terminated at each end by a Pyramid of six sides: * bitter, cold, and acrid to the taste.

* This is the form of pure Nitre, perfectly crystalized; but this, and all other Salts, are often foul, and shapeless.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. PURE NITRE.							
Small crystals	tender	heavy	glossy	CLEAR	moist	Finland, in Rapikevi stone	Nitrum Nudum, L.
2. STONY NITRE-ORE.							
Vast rocks	hard	heavy	plated	GREY	friable	Finland	Saxum Nitrosum, W. for nitre.
3. BROWN NITRE-ORE.							
Vast beds	brittle	light	dusty	DEEP BROWN	crumbly	Persia	Terra Nitrofa Humacea, W. for nitre.
4. WHITE NITRE-ORE.							
Thick strata	hard	heavy	crack'd	WHITISH	firm	India	Terra Nitrofa Calcareo, W. for nitre.
5. PLUMOSE NITRE.							
Small tufts	tender	light	thready	WHITE	crumbly	on rocks and walls	Nitrum Efflorescens, H. for nitre.

TH E S E are all the appearances in which Nitre is seen. The first is very rare; the Crystals lie in little fissures of the Stone: the second, third, and fourth are the proper ores of this Salt: and in the fifth it shews itself from such ores, or others, in irregular crystalizations.

Nitre in all these forms is one thing; disguised by various mixtures, as we see the earthy Fossils also often are; but from any of them it may be obtained pure by crystalization.

Till lately, this quality of crystalization was supposed peculiar to Salts; till very lately indeed: for 'tis but within these three weeks I have found Spar may be dissolved and crystalized again in the manner of Salts. In the preceeding part of this work,* I have lamented the ill success of four years trial: and formed my better hopes upon an assisting hand: that gentleman is absent from the kingdom; but my own farther trials have succeeded. The excellent Linnæus will be pleased with this; tho' it be contrary to his opinion; he only wanted to see *Terram, via humida, crystalisari posse abs sale*, to be less firm in the idea of all crystalization being owing to Salt. This

* Page 66.

ocular testimony is now given : and I must continue to remove the stony bodies out of the Saline System.

I am aware it will be objected by such as see but half way into philosophical enquiries ; that myself have proved Spar to have a Saline part ; by shewing it composed of the Mineral Acid, and Bitumen : but we must use precision in our words, as well as ideas, on these subjects. The Mineral Acid is not in itself a Salt : 'tis true, it forms them all by various mixtures. By another mixture, it forms Spar ; a Stone, with the form of a Salt : but that form is its own : it neither is the form of any Salt, nor is caused by any Salt : and that is what remained to be proved : the question solely was, Do Spars owe their angulated forms, to any Salt ? and that is answered, No,

A C I D S A L T S.

G E N U S II.

A L U M.

A dye of eight fides, with trigonal planes.

Austere and astringent to the taste; bubbling in the fire.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
I. P U R E A L U M.							
Minute crystals	hard	heavy	polished	COLOUR- LESS	pellucid	England, in cracks of fossil wood	Alumen Commune. L. in medicine, and the arts.
2. R O C K A L U M.							
Small crystals	hard	heavy	smooth	REDDISH	clear	Italy, in cracks of marble	Alumen Romanum. L. in medicine, and the arts.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
3. RUDE ALUM.							
Large masses	tender	heavy	irregular	GREYISH	opaque	Italy	L'Alun Virge Solide. W. for refining into alum.
4. PLUMOSE ALUM.							
Small tufts	soft	light	feathery	OLIVE-COLOUR'D	friated	Archipelago	Alumen Plumosum. W. a medicine.
5. GRANULATED ALUM.							
A dry powder	tender	light	uneven	WHITISH	small granules	Yorkshire	L'Alun Farineuse. W. for alum.
6. BLACK ALUM ORE.							
Vast cakes	hard	heavy	rudded	DEAD BLACK	bituminous	Yorkshire	Terra Aluminaris Nigra. W. for alum.

Terra Aluminaria
Fusca.
W.

for alum.

Saxony

bitumi-
nous

UMBER-
COLOUR'D

uneven

light

soft

Great lumps

7. BROWN ALUM ORE.

Terra Mellis
Catalpa

for alum.

Archipelago

alkaline

PURE
WHITE

rugged

light

hard

Small cakes

Fissilis Aluminaria
Cinerea
W.

for alum.

Yorkshire

flat

DUSKY
GREY

plated

heavy

hard

Vast strata

Fissilis Aluminaria
Nigra
W.

for alum.

Yorkshire

fissile

DEEP
BLACK

irregular

heavy

hard

Vast beds

10. BLACK ALUM SLATE.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
11. RED ALUM SLATE.							
Great strata	tender	heavy	rugged	REDDISH	fiffile	Yorkshire	Fiffile Aluminate Rubescens. W. for alum.
12. IRISH ALUM SLATE.							
Vast cakes	soft	heavy	irregular	DEAD BLACK	rudely fiffile	Ireland	Lapis Hibernicus H. a medicine for bruises.
13. ALUM ROCK.							
Great masses	very hard	heavy	uneven	REDDISH WHITE	fiffile	Italy	Calcareus Aluminaria. W. for alum.
14. COAL ALUM.							
Vast beds	hard	heavy	plated	BLACK	bitumi- nous	Northum- berland	Lithanthrax Aluminaria. W.

15. WOOD ALUM.

Oblong
pieces

heavy

coated

BROWN

wood-like

Bohemia

Alumina
Vegetabile,
W.

16. WEDGE ALUM.

Great cakes

heavy

crack'd

BLACK

breaks in
wedges

Sweden

Schistus Aluminosus
Cuneiformis,
Cr.

To these might be added, the Pyritæ, for they contain Alum; but Sulphur being more predominant, 'tis best to refer them thither.
'Tis thus the mixtures of nature render a perfect method in Fossils, in itself impracticable.
Metals, added to Alum, make what we call, Vitriols.

A C I D S A L T S.

G E N U S III.

V I T R I O L S.

A Rhomb more or less irregular,

Austere to the taste.

CRYSTALIZED SIMPLE VITRIOLS.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. GREEN VITRIOL.							
Rude crystals	tender	heavy	uneven	PALE GREEN	fix-fided	forest of Dean, in iron mines	Vitriolum Mars. L.
2. BLUE VITRIOL.							
Oblong crystals	hard	heavy	smooth	FINE BLUE	twelve- fided	island of Cyprus	Vitriolum Cyprium. L.
3. WHITE VITRIOL.							
Rude crystals	tender	heavy	uneven	DEAD WHITE	twelve- fided	Germany	a caustic. in medicine.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
8. BLUE STALACTICAL VITRIOL.							
Short cones	hard	heavy	rough	FINE BLUE	hollow	islands of Archipelago	Vitriolum Cupri Stalacticum. W. for blue vitriol.
9. BLUE EFFLORESCENT VITRIOL.							
Bubbly lumps	tender	light	botryoid	PALE BLUE	crumbly	Cyprus	Vitriolum Cupri Germinans. W. for blue vitriol.
MIXED VITRIOLS: SIMPLE AND FIRM.							
10. HERMAPHRODITE VITRIOL.							
Small crystals	hard	heavy	rough	BLUE GREEN	clustery	Hungary	Vitriolum Hermaphroditicum. L.
11. ICICLE VITRIOL.							
Perfect icicles	tender	light	coated	PALE BLUE GREEN	hollow	Bohemia	Vitriolum Cæruleovirens Stalacticum. W.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	C O L O U R.	QUALITIES.	P L A C E.	U S E S.
S T O N Y V I T R I O L O R E S.							
16. GLAUCOUS VITRIOL.							
Coarse crystals	tender	heavy	rudd	SEA GREEN	clustery	Saxony	Vitriolum Cincrum Ct.
17. RED VITRIOL ORE.							
Large masses	hard	heavy	irregular	BRICK COLOUR'D	cavernous	Archipelago	Vitriolum Chacitis. H.
18. GREY VITRIOL ORE.							
Rude lumps	brittle	light	uneven	PALE GREY	shattery	Archipelago	Vitriolum Sory. H.
19. YELLOW VITRIOL ORE.							
Large masses	hard	light	rudd	YELLOWISH	brittle	Archipelago	Vitriolum Misy. H.

20. BLACK VITRIOL ORE.

Great lumps

hard

heavy

rugged

DEAD
BLACK

cavernous

Greece

Vitriolum
Melanteria.
H.

EARTHY VITRIOLIC ORES.

21. CRUSTED VITRIOL ORE.

Flat lumps

tender

light

plated

BROWN

a yellow
crust on it

Germany

for vitriol.

Terra Vitriolica
Crustata.
H.

22. RED VITRIOLIC EARTH.

Great cakes

firm

heavy

uneven

REDDISH

fine

Germany

for vitriol.

Terra Vitriolica
Rubea.
W.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
23. BLACK VITRIOLIC EARTH.							
Great masses	tender	heavy	rugged	BLACKISH	coarse	Germany	Terra Vitriolica Nigra. W. for vitriol.
24. GREEN VITRIOLIC EARTH.							
Broad cakes	soft	heavy	rough	PALE GREEN	coarse	Germany	Terra Vitriolica Virescent. W. for vitriol.
25. BLUE VITRIOLIC EARTH.							
Flat cakes	tender	heavy	rugged	DIRTY BLUE	brittle	Ireland	Terra Vitriolica Cerulea. H. for vitriol.

S A L T S.

ORDER II.

A L K A L I N E.

Acrimonious, and fermenting with Acids.

G E N U S I.

N A T R U M.

A Prism of four sides, with pentagonal planes; with a Pyramid at each end, of two parallellogram planes.

Bitter to the taste; melting on the fire.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
1. PERSIAN NATRON.							
Friable cakes	tender	light	uneven	PALE BROWN	crumbly	Persia	Natron Antiquorum. L.
2. WALL NATRON.							
A tender efflorescence	soft	light	botryoide	WHITE	like hoar frost	on walls	Natron Marorum. L.
3. SPRING NATRON.							
Small crystals	firm	heavy	glossy	COLOUR- LESS	clustery	Bohemia, by sides of purging springs	Natron Fontanum. L.
4. EARTHY NATRON.							
Great cakes	tender	heavy	uneven	BROWN	clayey	Palæstine	Natron Hæselquidi. L.

5. LIMESTONE NATRUM.

Natrum
Rupium.
L.

A dry dust	tender	light	uneven	WHITISH	crumbly	England, Italy, on limestone and marble
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S A L T S.

ORDER III.
NEUTRAL.

Acrid; and not fermenting with Acids.

GENUS I.
SALARMONIA C.

Oblong, furrow'd, sharp-pointed Crystals.

Bitter, and urinous.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. CRUDE SAL ARMONIAC.							
Great cakes	hard	heavy	rugged	GREY	opaque	East Indies	Ammoniacum Concretum. W. a medicine.
2. SANDY SAL ARMONIAC.							
Great lumps	brittle	heavy	rough	BLACKISH	fandy	Greece	Sal Cyrenaicum Antiq.
3. EFFLORESCENT SAL ARMONIAC.							
Downy tufts	tender	light	rugged	WHITISH	crumbly	Persia	Ammoniacum Efflorescent. W.
4. WHITE VESUVIAN SAL ARMONIAC.							
Great cakes	tender	light	cavernous	GREYISH WHITE	sulphureous	Vesuvius	Ammoniac Fossile Blanc. W.

5. RED VESUVIAN SAL ARMONIAC.

Ammoniac Fossile
Rouge.
W.

Rude lumps	hard	heavy	rugged	REDDISH	dufty	Vesuvius
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6. YELLOW VESUVIAN SAL ARMONIAC.

Ammoniac Fossile
Jaundre.
W.

Rugged masses	hard	light	spongy	PALE YELLOW	fulphure- ous	Vesuvius
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7. GREEN VESUVIAN SAL ARMONIAC.

Ammoniac Fossile
Verd.
W.

Flat cakes	tender	light	rugged	GREENISH	cavernous	Vesuvius
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8. BLACK VESUVIAN SAL ARMONIAC.

Ammoniac Fossile
Noir.
W.

Great lumps	hard	heavy	irregular	BLACKISH	spongy	Vesuvius
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N E U T R A L S A L T S.

G E N U S II.

B O R A X.

A Prism of eight sides, with a truncated Pyramid at each end.

Disgustful to the taste; vitrifying in the fire.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. ROUGH BORAX.							
Rude cakes	hard	heavy	uneven	BLUEISH	opaké	East Indies	Borax Crudus. W. in medicine, and as folder to gold.
2. PURE BORAX.							
Small crystals	tender	heavy	polished	COLOUR- LESS	pellucid	East Indies	Borax Nedus. L. a medicine, and folder.

NEUTRAL SALT S.

G E N U S III.

R O C K S A L T.

Cubic Crystals; or hexædral.

Sharp to the taste; crackling in the fire.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. PURE ROCK SALT. S A L G E M M E.							
Vast masses	hard	heavy	polished	COLOUR- LESS	transpa- rent	Poland	in food.
2. RED ROCK SALT.							
Great lumps	hard	heavy	rugged	RED	femipel- lucid	Hungary	Muria Rebecqent, H.

Muria
Montana,
L.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
3. BLUE ROCK SALT.							
Vast masses	hard	heavy	polished	DEAD BLUE	clear	Hungary	Muria Cerulea. H.
4. GREEN ROCK SALT.							
Great masses	hard	heavy	smooth	GREEN	clear	Bohemia	Muria Virefcens. H.
5. YELLOW ROCK SALT.							
Great lumps	hard	heavy	rudd	YELLOWISH	clear	Hungary	Muria Flavescens.
6. EFFLORESCENT ROCK SALT.							
Low tufts	soft	light	thready	WHITISH	granulated	Poland, on salt rocks	Muria Germinans. W.

7. EARTHY ROCK SALT.

Great cakes	soft	light
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BROWN

saline to the taste

Hungary

Muria
Terrea.
H.

8. STONY ROCK SALT.

Vaſt maſſes	hard	heavy
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PALE
BROWN

ſaline

Hungary

Muria
Lapidea.
H.

9. SEA SALT.

Rude cryſtals	hard	heavy
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BROWN

acrid

rocks on the
ſea coaſt

Muria
Marina.

NEUTRAL SALT S.

GENUS IV.

SWISS SALT.

Hollow Cubes; or hollow Pyramids.

Acrid to the taſte; crackling in the fire.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. CUBIC SWISSE SALT.							
Small masses	tender	heavy	rough	WHITISH	brittle	Switzerland	Neutrum Cubicum. W.
2. OBLONG SWISSE SALT.							
Little clusters	soft	heavy	rudd	YELLOWISH	firm	Germany	Neutrum Parallelipedum. W.
3. PYRAMIDAL SWISSE SALT.							
Small masses	tender	heavy	rough	PALE BROWN	brittle	Bothnia	Neutrum Pyramidale. W.

*That this is not Rock Salt, or Sea Salt, tho' nearly ally'd to it, is proved by chemical experiments.

NATIVE FOSSILS.



CLASS X.

SULPHUREOUS:

Inflammable, electrical, soluble in oil.

GENUS I.

SULPHURS.

Uniform, pure, or earthy; burning with a blue flame, and suffocating smell.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOR.	QUALITIES.	PLACE.	USES.
1. CRYSTALLINE SULPHUR.							
Small masses	firm	heavy	glossy	PALE YELLOW	transpa- rent	Peru	Sulphur Vivum Pellucidum. W. medicine.
2. YELLOW NATIVE SULPHUR.							
Large masses	hard	heavy	smooth	STRONG YELLOW	opaque	Germany	Sulphur Vivum Opacum. medicine.
3. VESUVIAN SULPHUR.							
Tufts of threads	tender	light	bright	FAINT YELLOW	strong scented	Vesuvius, in cracks of rocks	Sulphur Vivum Capillare. W. medicine.
4. EFFLORESCENT SULPHUR.							
A dust	soft	light	granulated	PALE YELLOW	mild scented	Aix la Chapelle	Sulphur Vivum Efflorescens. W. medicine.

5. WHITE SULPHUR ORE.							Sulphur Coloratum Album. W.
Small masses	tender	heavy	rugged	WHITISH	soft	Vesuvius	medicine.
6. GREY SULPHUR ORE.							Sulphur Vivum Coloratum. W.
Vast cakes	hard	heavy	irregular	DEAD GREY	rough	Iceland	a medicine.
7. GREEN SULPHUR ORE.							Sulphur Coloratum Viride. W.
Large lumps	hard	light	rugged	GREEN	bright	Vesuvius	
8. BLACK SULPHUR ORE.							Sulphur Coloratum Nigrum. W.
Great cakes	hard	heavy	scaly	BLACK	bitumi- nous	Germany	for sulphur.

N A T I V E F O S S I L S.

G E N U S II.

M A R C A S I T E S.

Heavy, metalline, angulated bodies.

I. C U B I C.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USE S.
1. YELLOW CUBIC MARCASITE.							
Regular cubes	hard	very heavy	smooth	GREENISH YELLOW	angles entire	Northum- berland, in slate	Marcasita Tessellaris. W. for sulphur.
2. YELLOW PRISMATIC MARCASITE.							
Oblong pieces	hard	heavy	smooth	YELLOW	irregular planes	Germany	Marcasita Prismatica Hexachia. W. for making sul- phur.

3. STRIATED CUBIC MARCASITE.			Marcasita Cubica Striata de Lisle.		
Small cubes	hard	very heavy	glossy	WHITISH	striated contrary ways
4. RHOMBOIDAL MARCASITE.			Marcasita Rhomboidalis. W.		
Large masses	very hard	heavy	scaly	YELLOW	Germany
5. TRUNCATED MARCASITE.			Marcasita Truncata. W.		
Large clusters	hard	heavy	polished	DUSKY YELLOW	angles cut off
6. FOURTEEN-SIDED MARCASITE.			Marcasita Dodecahedra. W.		
Large clusters	hard	heavy	glossy	BRONZE OF GREEN AND YELLOW	thready
					Germany
					for brimstone.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
7. RUSTY MARCASITE.							
Small cubes	hard	heavy	rugged	RUST COLOUR'D	fourteen faces	England, France	Marcasita Profundius Truncata de Lisle. for brimstone.
8. EIGHTEEN-SIDED MARCASITE.							
Loose cubes	very hard	heavy	smooth	YELLOW	angles cut off	Sweden	Pyrites Crystallinus Octodekahedrus, L. for brimstone.
9. STRIATED RECTANGULAR MARCASITE.							
Great clusters	hard	heavy	scaly	GREENISH	striated	Germany	Marcasita Cubica Striata de Lisle. for brimstone.
10. TWELVE-SIDED MARCASITE.							
Large clusters	very hard	heavy	smooth	BRASSY YELLOW	polished	Sweden	Pyrites Crystallinus Dodekahedrus, L. for brimstone.

P Y R A M I D A L :

11. REGULAR PYRAMIDAL MARCASITE.

Large
clusters

hard

heavy

GREENISH
YELLOW

rugged

equal
fides

Germany

for brimstone.

Pyrites Crystallinus
Tetrahædrus,
L.

12. LONG PYRAMIDAL MARCASITE.

Small
clusters

hard

heavy

BRIGHT
BRASSY
YELLOW

polished

irregular

Germany

for brimstone.

Pyrites
Henckellii
de Lillie.

13. TRUNCATED PYRAMIDAL MARCASITE.

Great
clusters

hard

heavy

BROWNISH

rugged

angles cut
off

Germany

for brimstone.

Pyrites Pyramidalis
Truncatus
de Lillie.

3. OCTAHÆDRAL.

Composed of two quadrilateral Pyramids, joined base to base.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
14. REGULAR OCTAHÆDRAL MARCASITE.							
Large clusters	hard	heavy	rough	GREENISH YELLOW	eight equal triangles	Saxony	Marcasite Octædre Regulier de Lisse. for brimstone.
15. LONG OCTAHÆDRAL MARCASITE.							
Single pieces	very hard	heavy	glossy	BRASSY YELLOW	eight unequal triangles	Saxony	Marcasite Octædre Allongé de Lisse. for brimstone.
16. IRREGULAR OCTAHÆDRAL MARCASITE.							
Small clusters	hard	heavy	scaly	YELLOW	eight irregular triangles	Germany	Marcasite Octædre Inégale de Lisse. for brimstone.

17. TRUNCATED OCTAHEDRAL MARCASITE.

Great
clusters

tender

light

polished

BRASSY

angles cut
off

Saxony

for brimstone.

Marcasite Octaèdre
Tronqué
de Lisle.

18. FLATTED OCTAHEDRAL MARCASITE.

Clusters

hard

heavy

scaly

GREENISH
YELLOW

low

Bohemia

for brimstone.

Marcasite Octaèdre
Comprimé
de Lisle.

19. OBLIQUE OCTAHEDRAL MARCASITE.

Single pieces

hard

heavy

polished

GOLD
YELLOWoblique
joinings

Germany

for brimstone.

Marcasite Octaèdre
Oblique
de Lisle.

20. BRONZ'D OCTAHEDRAL MARCASITE.

Great
clusters

hard

heavy

rugged

BRONZ'D
GREENsolid angles
cut off

Saxony

for brimstone.

Marcasite Octaèdre
à 14 Facettes
de Lisle.

4. POLYGONAL MARCASITES.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USE S.
Great clusters	very hard	heavy	scaly	BRASSY YELLOW	two pentagonal Pyramids	Germany	Marcasite Dodecahedre de Lisle for brimstone.
Small clusters	hard	heavy	rude	GREENISH	twenty equilateral triangles	Saxony	Marcasite Icosaedre de Lisle for brimstone.

NATIVE FOS SIL S.

GENUS III.

PYRITES.

Globular, rugged, flattened, or hollow'd; and striated within.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
1. GLOBULAR PYRITES.							
Round, rough lumps	hard	very heavy	warted	FERRUGI- NEOUS BROWN	large striae	England	<i>Pyrites Figuratus Globosus.</i> L. for sulphur.
2. HEMI-SPHERIC PYRITES.							
Great cakes	very hard	heavy	rugged	GREENISH BROWN	fine striae	Cornwall	<i>Pyrites Figuratus Haemisphaericus.</i> L. for brimstone.
3. HOLLOW PYRITES.							
Oblong masses	tender	heavy	rough	FERRUGI- NEOUS	tubular	Sweden	<i>Pyrites Figuratus Fritulosus.</i> L. for brimstone.
4. PLATED PYRITES.							
Flatted masses	hard	heavy	scaly	GREENISH BROWN	upright scales	Sweden	<i>Pyrites Figuratus Laminosus.</i> L. for brimstone.

NATIVE FOS SILS.

GENUS IV.
MUNDIC.

Of no certain shape; heavy, and of a metalline aspect.

I. BRIGHT, AND STRIKING FIRE WITH STEEL.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOR.	QUALITIES.	PLACE.	USES.
1. SMOOTH MUNDIC.							
Flat masses	hard	heavy	even	DUSKY GREEN	bright	Cornwall	Pyrites Ferri Æqu. lib. L. for sulphur.
2. GRANULATED MUNDIC.							
Great masses	hard	heavy	rugged	GREEN, AND VIOLET	bright, grain'd	Cornwall	Pyrites Ferri Granulatus. L. for brimstone.

3. STREAKY MUNDIC.

Vast cakes hard heavy

PALE
YELLOW

striated,
and bright

Derbyshire

for brimstone.

*Pyrites Ferr
Chalybeatus.*
L.

2. IMPURE, DULL, AND SCARCE STRIKING FIRE WITH STEEL.

4. SPANGLE MUNDIC.

Great masses hard heavy

WHITISH,
AND
YELLOW

full of
spangles
of talc

Germany

for brimstone.

*Pyrites Cupri
Miscell.*
L.

5. TALCY MUNDIC.

Rude lumps tender light

BROWN,
AND
YELLOW

with
plates of
talc

Sweden

for brimstone.

*Pyrites Cupri
Talcifus.*
L.

6. CHAFFY MUNDIC.

Large cakes hard light

BLACK,
BROWN,
AND
YELLOW

plates of
talc and
clay

Germany

for brimstone.

*Pyrites Cupri
Aerofus.*
L.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USE.
7. CHAWN MUNDIC.							
Vast masses	hard	heavy	uneven	YELLOWISH BROWN	bright specks	Sweden	Pyrites Cupri L. <i>Pyritus</i> for brimstone.
8. GOLDEN MUNDIC.							
Small cakes	very hard	heavy	undulated	GOOD YELLOW	stony mixture	Germany	Pyrites Cupri L. <i>Pyritus</i> for brimstone.
9. GREEN MUNDIC.							
Great cakes	hard	very heavy	rugged	GREEN	shining	Sweden	Pyrites Cupri Viridescens. L. <i>Pyritus</i> for brimstone.
10. LIVER MUNDIC.							
Vast cakes	hard	very heavy	raised in lumps	RUDDY BROWN	fine	Sweden	Pyrites Cupri Hepaticus. L. <i>Pyritus</i> for brimstone.

Asy lumbæ ælā pūq
11. HONEYCOMB MUNDIC.

Rude lumps hard

light

porous

RUSTY
YELLOW

coarse

Sweden

for brimstone.

12. FIRM MUNDIC.

Vast flat
cakes

very hard

very
heavy

smooth

GREENISH
YELLOW

perfectly
fine

Germany

for brimstone.

13. GRITTY MUNDIC.

Rough
masses

friable

heavy

granulated

CRISTY
YELLOW

coarse

Sweden

for brimstone.

14. RHOMBIC MUNDIC.

Flat cakes

hard

heavy

flaky

GREENISH
YELLOW

breaks in
rhombs

Sweden

for brimstone.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S .
15. CRYSTALLINE MUNDIC.							
Rude lumps	very hard	very heavy	botryoid	GREENISH YELLOW	breaks like flint	Sweden	Pyrites Copri Quartzolus. L.
16. STONY MUNDIC.							
Great masses	hard	heavy	rudd	YELLOWISH	very fine	Germany	Pyrites Copri Constat. L.
17. PURPLE MUNDIC.							
Vast lumps	very hard	heavy	rough	DEEP TAWNY PURPLE	coarse	Sweden	Pyrites Aqueolus. L.

SULPHUREOUS FOSSILS.

G E N U S V.

A M B E R G R I S E *.
A M B R A.

Light, tender, of a perfumed scent; swimming on water.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	C O L O U R.	QUALITIES.	P L A C E.	U S E S.
1. GREY AMBERGRISE.							
Small masses	very tender	very light	smooth.	PALE GREY	crumbly	East Indies	Ambra Ambrosiaca. L. in perfumes, and medicine.
2. WHITE AMBERGRISE.							
Little lumps	brittle	light	scaly	WHITE	friable	Africa	Ambra Unicolora Alba. W. perfume.

* Feathers, and beaks of birds, and fish bones, are often found in Ambergrise.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
3. YELLOW AMBERGRISE.							
Rugged cakes	tender	light	rough	PALE YELLOW	very opaque	Madagascar	Ambra Unicolor Citrina. W. perfume.
4. BROWN AMBERGRISE.							
Rounded lumps	hard	heavy	coated	DUSKY BROWN	coarse	Greenland	Ambra Unicolor Fusca. W. a coarse perfume.
5. BLACK AMBERGRISE.							
Round lumps	hard	heavy	polished	JET BLACK	firm	Greenland	Ambra Unicolor Nigra. W. a coarse perfume.
6. COARSE AMBERGRISE.							
Rude masses	soft	light	cavernous	DIRTY BROWN	friable	North Seas	Ambra Vulgatior. L. a coarse perfume.

7. YELLOW MOTTLED AMBERGRISE.

Small cakes | very soft | light

8. BLACK MOTTLED AMBERGRISE.

Rude lumps | tender | light

uneven
PALE GREY,
WITH YEL-
LOW SPOTS

tough

the finest of per-
fumes.

rugged
GREY, AND
BLACK

soft

Madagascar a very fine perfume.

Ambra Grisea Maculis
Flavis,
W.

Ambra Grisea Maculis
Nigris,
W.

U S U L P H U R E O U S F O S S I L S.

G E N U S VI.

A M B E R.

S U C C I N U M.

Light, firm, fragrant when rubb'd, and electrical; sinking in water.

I. NATURALLY PELLUCID.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
1. PURE YELLOW AMBER.							
Great cakes	firm	very light	polished	PALE YELLOW	pellucid	Prussia	Succinum Electricum. L. a medicine.
2. MILKY AMBER.							
Small masses	hard	very light	smooth	WHITISH	pellucid	East Indies	Succinum Pellucidum Album. W. medicine.
3. GOLDEN AMBER.							
Large lumps	firm	light	rumpled	GOLD YELLOW	pellucid	the Baltic	Succinum Pellucidum Falsum. W. medicine.
4. RUDDY AMBER.							
Small masses	hard	very light	wavy	DUSKY RED	pellucid	Prussia	Succinum Pellucidum Rubrum. W. in medicine.

2. NATURALLY OPAKE.

5. WHITE AMBER.

Rude lumps

hard

light

CHALKY
WHITE

opaque

Denmark

Succinum Opacum
Album.
W.medicine, and the
arts.

6. COARSE YELLOW AMBER.

Great cakes

firm

very
lightCOARSE
YELLOW

foul

Prussia

Succinum Opacum
Flavescens.
W.medicine, and the
arts.

7. BROWN AMBER.

Small cakes

hard

light

YELLOWISH
BROWN

foul

Prussia

Succinum Opacum
Fuscum.
W.medicine, and the
arts.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USE.
8. GREY AMBER.				BLUEISH, OR GREENISH GREY			Succinum Opacum Ceruleum. W.
Large lumps	hard	light	rugged		foul	Germany	in the arts.

Ambers, coloured by art, should be excluded from a collection of natural curiosities. 'Tis a nice method, and a difficult thing to accomplish; but there are some ingenious Polish Jews, who make a trade of it. A great deal of the pale yellow, streaky Amber has gone through their hands; and I have seen purple, and green Ambers, whose colours were not naturally their own.

Insects, in Amber, make a pretty addition to the kinds, kept in a cabinet; and they are best arranged separately after these; according to the distinct kinds of Amber, which contain them.

SULPHUREOUS FOSSILS.

G E N U S VII.
W A T E R - O I L.

N A P H T H A.

Very light; very thin; of a strong sinell.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. COLOURLESS NAPHTHA.							
Watery	purest of fluids	lightest of fluids	bright	CLEAR	most inflammable	Media	Naphtha Hyalina. L. for light.
2. WHITISH NAPHTHA.							
Whey-like	pure	light	cloudy	BRIGHT	very inflammable	Persia	Bitumen Naphtha. L. for lights.
3. BROWN NAPHTHA.							
Oily	pure	very light	cloudy	PALE YELLOWISH BROWN	strong scented	Persia	Naphtha Obscura. W. in medicine.
4. RUDDY NAPHTHA.							
Oily	pure	light	bright	REDDISH	very strong scented	Italy	Naphtha Rubescens. W. in medicine.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
5. GREEN NAPHTHA.							Naphtha Viridis. W.
Watery	pure	light	very bright	GREENISH	less scented	Germany	

SULPHUREOUS FOSSILS.

GENUS VIII.

R O C K - O I L.

PETROLEUM.

Light; of the thickness of oil; ill smelling;

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
1. YELLOW PETROLEUM.							
Oily	clear	light	bright	PALE YELLOW	very in- flammable	Italy	for lamps. Oleum Montanum Leucum. Wolt.
2. BROWN PETROLEUM.							
X x Oily	foul	light	duky	RUDDY BROWN	strong scented	Italy	for lights. Bitumen Petroleum. L.
3. BLACKISH PETROLEUM.							
Thick	very foul	light	cloudy	BLACKISH BROWN	earthy	Germany	in medicine. Petroleum Oleum Terra. W.

SULPHUREOUS FOSSILS.

G E N U S IX.
E A R T H - O I L.
M A L T H A.

Light; strong scented; thick as Tar.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
1. RUDDY MALTHA.							
Scarce fluid	pure	light	bright	DEEP REDDISH- BROWN	sticking to the fingers	Mount Caucasus	Bitumen Mumia. L. for mummies.
2. BLACK MALTHA.							
Very thick	[foul	light	cloudy	BLACK	strong scented	Persia	Bitumen Maltha. L. for lights.

SULPHUREOUS FOS SILS.

G E N U S X.

A S P H A L T H S.

A S P H A L T A.

Light; tough like pitch; brittle; strong scented.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. PURE ASPHALT.							
Great cakes	brittle	light	rugged	DEEP BLACK	scented	Greece, and Sweden	Bitumen Asphaltum, L. in medicine.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
2. RUDDY ASPHALT.							
Vast lumps	hard	light	flaky	REDDISH	very stinking	Sweden	Bitumen Hepaticum. L. medicine.
3. TURFF ASPHALT.							
Thick strata	tough	light	most irregular	BLACKISH BROWN	full of roots	England	Terra Bitumenosa Turfacea. W. for firing.
4. DUSTY ASPHALT.							
Great cakes	tender	light	rugged	BLACK	moulders to dust	Germany	Terra Bitumenosa Humacea. W. firing.
5. SLATY ASPHALT.							
Thin strata	hard	heavy	plated	DEEP BLACK	filfill	England	Terra Bitumenosa Filfillis. W. firing.

SULPHUREOUS FOSSILS.

G E N U S XI.

C O A L.

L I T H A N T H R A X.

Hard; heavy; stone-like.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
1. BRIGHT COAL.							
Vaſt ſtrata	tender	heavy	flaky, and clean	SHINING BLACK	bright	England	Bitumen Lithanthrax, L. for firing.
2. DULL COAL.							
Vaſt ſtrata	hard	heavy	rugged, and duſty	DEAD BLACK	obſcure	England	Lithanthrax Durior, W. for firing.

SULPHUREOUS FOSSILS.

GENUS XII.

JET.

GAGAS.

Hard; light; amber-like.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. PURE JET.							
Great masses	hard	very light	smooth	FINE DEEP BLACK	swims on water	Germany	Bitumen Gagas. L. for ornaments.
2. BRITTLE JET. CANAL COAL.							
Thick strata	brittle	light	rough	DEEP BLACK	sinks in water	England	Lapis Ampelites. H. Ornaments, and firing.

SULPHUREOUS FOSSILS.

G E N U S XIII.

O R P I M E N T.

A U R I P I G M E N T U M.

Talc; bright; flexible when pure; burning with a garlic smell.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
1. PLATED YELLOW ORPIMENT.							
Flat cakes	tender	heavy	polished	GOLD YELLOW	flexile, like talc	Smyrna	Pyrites Auripigmentum. in painting.
2. SPANGLED YELLOW ORPIMENT.							
Vast lumps	hard	heavy	scaly	PALE YELLOW	shattery	Turkey	Auripigmentum Flavescens. H. in painting.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
3. SPANGLED RED ORPIMENT*.							
Small lumps	tender	heavy	flaky	BRIGHT RED	in a grey coarse kind	Germany	Auripigmentum Cinnabarium. H. painting.
4. SOLID RED ORPIMENT.							
Great lumps	hard	heavy	smooth	FINE DEEP RED	flattery	Greece	Sandaracha Autorum. H. for painting.
5. EARTHY YELLOW ORPIMENT.							
Large lumps	soft	heavy	rough	GOOD YELLOW	brittle	Germany	Zarnichium Flavum. H. for painting.
6. EARTHY GREEN ORPIMENT.							
Great cakes	tender	heavy	rough	DIRTY GREEN	brittle	Germany	Zarnichium Viridescens. H. in painting.

7. EARTHY WHITE ORPIMENT.

Zamichium
Albescens,
H.

Large lumps

brittle

heavy

rugged

WHITISH
GREYyellow
spangles

Germany

in painting.

* The Yellow Orpiments become red, by burning : but these are so in nature.

SULPHUREOUS FOSSILS.

G E N U S XIV.

A R S E N I C.

A R S E N I C U M.

Crystalline; with truncated Prisms; burning with a garlic smell.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USE S.
1. PURE ARSENIC.							
Clusters of crystals	hard	heavy	polished	COLOUR- LESS	pellucid	Bohemia	Arsenicum Nudum. L. a poison.
2. CRUSTED ARSENIC.							
Small lumps	tender	heavy	scaly	WHITISH	breaks in scales	Hungary	Arsenicum Tefiacum. L. poison.
3. FLAKY ARSENIC.							
Flat cakes	soft	light	plated	GREY	fissile	Sweden	Arsenicum Squamosum. L. a poison.
4. HONEYCOMB ARSENIC.							
Rude lumps	hard	heavy	full of holes	WHITISH BROWN	stinking	Bohemia	Arsenicum Porosum. L. a poison.

NATIVE FOSSILS.

CLASS XI.

SEMI-METALS.

Metalline; heavy; not malleable.

GENUS I.

QUICKSILVER.

HYDRARGYRUM.

Silvery white; shining; fluid; volatile.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. VIRGIN QUICKSILVER.							
Fluid	soft	very heavy	polished	SILVERY WHITE	moveable	Peru, Germany, Sweden	Hydrargyrum Virgineum. L. in medicine, gilding.
2. RUBY QUICKSILVER †.							
A cubic crystal	tender	very heavy	bright	PURE RED	transparent	Germany, Sweden	Hydrargyrum Crystallinum. L. in medicine, and painting; and for quicksilver
3. STRIATED CINNABAR †.							
Flatted cakes	hard	heavy	smooth	SCARLET	streaky	China	Hydrargyrum Cinnabaris. L. in medicine, and painting; and for quicksilver

* The variation in the aspect, and mixture of the ores of Metals, is utterly without end. The great attempt must be to distinguish the principal Varieties; and under these, to arrange in the cabinet, those whose farther mixtures render them subordnately various again.

† All the Cinnabars are ores of Quicksilver, with Sulphur.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
4. FLAKY CINNABAR.							
Rude lumps	hard	very heavy	scaly	STRONG RED	friable	Hungary	Hydragyrum Cinnabaris <i>L.</i> for quicksilver.
5. GRANULATED CINNABAR.							
Coarse masses	tender	heavy	rugged	FINE RED	brittle	Germany	Hydragyrum Cinnabaris <i>L.</i> for quicksilver.
6. CRYSTALLIZED CINNABAR.							
Small masses	hard	very heavy	polished	BRIGHT RED	shining	Saxony	Hydragyrum Cinnabaris <i>L.</i> for quicksilver.
7. JAPAN CINNABAR.							
Small masses	very hard	heavy	smooth	SCARLET	glossy	Japan	Hydragyrum Glandulosum <i>L.</i> in painting.

8. EARTHY CINNABAR.

Small masses	soft	very heavy
--------------	------	------------

9. CRACKLING QUICKSILVER.

Small lumps	hard	very heavy
-------------	------	------------

STRONG
RED

ochreous

Sweden

Hydargyrum Cinnabaris
Friabilis
Cronstedt.

for quicksilver.

RAVEN
GREY

crackles in
the fire

Sweden

Hydargyrum
Cripetans.
L.

for quicksilver.

N A T I V E F O S S I L S.

G E N U S I L.

B I S M U T H.

V I S M U T U M.

Yellowish white; flaky; brittle, yet soft.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
1. FLAKY NATIVE BISMUTH.							
Flat masses	tender	heavy	scaly	SILVERY WHITISH	filile	Sweden	Vismutum Nativum Squammosum Cronstedt.
2. CUBIC NATIVE BISMUTH.							
Confused clusters	hard	heavy	irregular	YELLOWISH	little cubes	Saxony	Vismutum Nativum Cubicum Cronstedt.
3. EFFLORESCENT BISMUTH.							
A dust	tender	light	powdery	PURE WHITE	spreading on stones	Sweden	Vismutum Efflorescens Cronstedt.
4. SHATTERY BISMUTH ORE.							
Great lumps	brittle	heavy	scaly	SILVERY GREY	formed of broad flakes	Sweden	Vismutum Commune. L.

Vismutum
Squamosum
Cronstedt.

Vismutum
Cuneiforme
Cronstedt.

Vismutum
lacr.
L.

5. SPARKLING BISMUTH ORE.

Small cakes | hard | very heavy

6. WEDGY BISMUTH ORE.

Great lumps | tender | heavy

7. STREAKY BISMUTH ORE.

Flat cakes | hard | very heavy

PALE
YELLOWISH
rugged
form'd of
small
scales

Sweden

DUSKY
GREY
of wedge-
like scales

Saxony

BLUEISH
GREY
of striated
scales

Germany

NATIVE FOS SILS.

G E N U S III.

Z I N K.

Z I N C U M.

Lead-colour'd; brittle; crackly; composed of flatted Pyramids.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
I. CRYSTALLINE ZINK.							
Clusters of crystals	tender	very heavy	rugged	BRIGHT GREY	of slender truncated crystals	Germany	Zincum Crystallinum. L. in medicine.
2. INDURATED ZINK.							
Rude lumps	hard	heavy	smooth	WHITISH GREY	spär-like	Sweden	Zincum Induratum Cronstedt.

3. TILY ZINK ORE. Large lumps	firm	very heavy	ridg'd	PALE GREY	of plates, like tiles	Germany	Zincum Mineralisatum, L.
4. PALE CALAMINE.* Rude masses	tender	light	rugged	WHITISH BROWN	cavernous	England	Lapis Calaminaris Albescens Cronstedt. for zink.
5. YELLOW CALAMINE. Large lumps	hard	heavy	rough	PALE YELLOW	granulated	England	Zincum Calaminaris, L.
6. RUDDY CALAMINE. Small masses	brittle	very heavy	rugged	REDDISH	stony	Poland	Lapis Calaminaris Rubescens Cronstedt.

* All the Calamines are ores of Zink.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
7. CLAYEY CALAMINE.							
Great cakes	tough	heavy	smooth	YELLOWISH	soft	Germany	Lapis Calaminaris Argillaceus Gronstedt.
8. SWABIAN ZINK ORE.							
Vast masses	hard	very heavy	granulated	PALE GREY	glittering	Sweden	Zincum Swabii. L.
9. FIBROSE ZINK ORE.							
Small lumps	hard	heavy	striated	LEAD COLOUR'D	shining	Germany	Zincum Sibiricum s. L.
10. RIDGED ZINK ORE.							
Small masses	very hard	heavy	uneven	LEAD COLOUR'D	upright scales	Sweden	Zincum Sibiricum s. L.

Zincum
Sterile.
L.Zincum
Chalybeatum
Cronstedt.Zincum
Rapax.
L.Pseudogalenæ
Virens
Cronstedt.

11. CUBIC BLENDE.*				bright, and scaly	Germany	Zincum Sterile. L.
Great lumps	hard	very heavy	raised in ridges			
12. STEEL-GRAIN'D BLENDE.				glittering	Sweden	Zincum Chalybeatum Cronstedt.
Great masses	hard	heavy	rugged			
13. YELLOW BLENDE.				semi- transpa- rent	Hungary	Zincum Rapax. L.
4 Flatted lumps	tender	heavy	smooth			
14. GREEN BLENDE.				scaly	Germany	Pseudogalenæ Virens Cronstedt.
Small lumps	hard	heavy	rugged			

* All the Blendes are also Zink Ores.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
15. BLACK BLENDE.							
Vast masses	hard	very heavy	uneven	DEAD BLACK	breaks in flakes	Sweden	Pseudogalena Nigra Crustified.
16. BROWN BLENDE.							
Great cakes	tender	heavy	scaly	DIRTY BROWN,	filful	Germany	Pseudogalena Fufca, Crustified.
17. WHITE BLENDE.							
Rounded lumps	hard	heavy	granulated with fine scales	WHITISH	semi-pellucid	Sweden	Pseudogalena Alba Crustified.
18. LEMON BLENDE.							
Flat cakes	hard	very heavy	scaly, and glittering	VERY PALE YELLOW	pure	Sweden	Pseudogalena Pullidiflava Crustified.

19. RUDDY BLENDE.

Great lumps very hard

heavy

rudded

REDDISH
BROWN

sparkling
with small
scales

Germany

Pseudogalena
Rubescens
Cronstedt.

20. UMBER BLENDE.

Vast cakes

hard

heavy

rough

FINE DARK
BROWN

sparkling

Germany

Pseudogalena Sordide
Fusca
Cronstedt.

21. CONGLOMERATE BLENDE.

Roundish
masses

hard

heavy

rudded

BLACK

breaks in
octohedral
forms

Germany

Zincum
Crystallinum.
L.

NATIVE FOS SILS.

G E N U S IV.
A N T I M O N Y.
S T I B I U M.

Fibrose; friable; silvery.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
I. NATIVE ANTIMONY.							
Rugged masses	tender	heavy	fibrose	WHITISH	pure	Sweden	Stibium Nativum, L. in medicine.
2. COARSE ANTIMONY ORE.							
Great cakes	brittle	heavy	rugged	LEAD COLOUR'D	thick striae	Germany	Antimonium Mineralisatum Crassius Croasfeldt.

A. M.
Tenuius
Cronstedt.

A. M.
Chalybestum.

A. M.
Crysallicum
Cronstedt.

A. M.
Solare
Cronstedt.

for antimony.

3. NEEDLE ANTIMONY ORE.

Small masses tender lighter

4. STEEL GRAIN'D ANTIMONY ORE.

Great lumps hard heavy

5. PYRAMIDAL ANTIMONY ORE.

Small masses tender lighter

6. RED ANTIMONY ORE.

Great lumps hard heavy

WHITISH
GREY

STEEL-
COLOUR'D

WHITISH

REDDISH

striated

rugged

cavernous,
and
pointed

striated

fine striae

sparkling

of concentric
pyramids

of fine
perfect
striae

Sweden

Germany

Sweden

Saxony

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
7. PURPLE ANTIMONY ORE.							
Great masses	hard	very heavy	streaky, and rugged	DUSKY PURPLE	abrupt striae	Sweden, Hungary	A. M. Abruptum Cronstedt.
8. FEATHER'D ANTIMONY ORE.							
Small lumps	tender	light	feathery	SILVERY WHITE	friable	Germany	A. M. Argentiforme Cronstedt.
9. SILVER ANTIMONY ORE.							
Large masses	hard	very heavy	rugged	DARK GREY	rub to a red powder	Sweden	A. M. Argenteo Cupreum Cronstedt.
10. PRISMATIC ANTIMONY.							
Small lumps	hard	heavy	striated	BRIGHT	of multi-lated prisms	Sweden	A. M. Crystallinum Cronstedt.

II. RADIATED ANTIMONY ORE.

Sibium
Striatum,
L.

for letter-
founders.

Germany

of cross-
ing striae

LEAD
COLOUR'D

thready

heavy

tender

Great lumps

N A T I V E F O S S I L S.

G E N U S V.

C O B A L T.

COBALTUM*.

Fine; brittle; steel-like; whitish grey; not fusible,

* Cobalt has been denied to be a distinct Semi-Metal: but Brandt discovered, and Cronstedt confirmed the fact. Its glass, with the Phlogiston, makes a true Regulus.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. BLACK COBALT.							
Flat cakes	soft	heavy	dusty	DEAD BLACK	earthy, when broken	Germany	Cobaltum Califorme Nigrum Crassifect. for arsenic.
2. SLAGGY COBALT.							
Great lumps	very hard	heavy	cavernous	DARK GREY	glossy	Sweden	Minera Cobalti Vitrea Crassifect.
3. EARTHY RED COBALT.							
Great masses	tender	heavy	dusty	DEEP RED	earth-like	Sweden	Cobaltum Arsenicale Terreum Crassifect.
4. RUBY COBALT.							
Small masses	very hard	very heavy	glossy	FINE RED	star-like rays	Saxony	Cobaltum Arsenicale Crassifectum Crassifect.

5. STEEL-GRAIN'D COBALT.									Cobaltum Chalybeatum Cronstedt.
Large lumps	hard	very heavy	rugged	IRON GREY	fine grain'd	Saxony			
6. COARSE-GRAIN'D COBALT.									Cobaltum Crassius Cronstedt.
Great masses	brittle	heavy	rough	BLACKISH	granulated	Saxony			
7. ARBORESCENT COBALT.									Cobaltum Dendriticum Cronstedt.
Irregular masses	brittle	light	twiggy	SILVERY	in form of den- drita	Saxony			
8. POLYHEDRAL COBALT.									Cobaltum Polyhedrum Cronstedt.
Rounded lumps	hard	heavy	many planes	GREY	shining	Saxony			

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
9. PYRITINE COBALT.							
Rounded lumps	tender	heavy	botryoide	SILVERY	radiated, when broken	Norway	Cobaltum Radiatum Cronstedt.
10. WHITE POLYGONAL COBALT.							
Small lumps	hard	heavy	angulated	TIN COLOUR'D	bright	Sweden	Cobaltum Polygonum Cronstedt.
11. PALE GLASSY COBALT.							
Great lumps	very hard	heavy	irregular	PALE GREY	glassy	Sweden	Cobaltum Calciforme Album Cronstedt.
12. ORANGE COBALT.							
Great lumps	hard	heavy	angulated	REDDISH YELLOW	bright	Sweden	Cobaltum Glanz Cobalt. Cronstedt.

N A T I V E F O S I L S.

G E N U S V.

N I K E L.

N I C C O L U M *.

Solid; shining; reddish; crackly.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
Vast lumps	hard	very heavy	rugged	ORANGE COLOUR'D	glassy	Sweden	Niccolum Calciforme Vitrescens Crystalline

* Linnæus doubts the reality of Nickel, as a distinct Semi-Metal; but the same arguments prove it, that prove the Cobalt such; which he allows. The world is infinitely obliged to the Swedish miners for the accurate experiments they have made on Ores: we have a new idea of the metalline art from their labours.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
2. SCALY NIKEL.							
Small masses	hard	heavy	ridgy	DULL YELLOW	flaky	Sweden	Nickolum Squammosum Cronstedt.
3. EARTHY NIKEL.							
Great cakes	brittle	heavy	dusty	DULL GREEN	clay-like	Sweden	Nickolum Martiale Cronstedt.
4. VITRIOLIC NIKEL.							
Small masses	tender	light	rugged	FINE GREEN	ochreous	Sweden	Nickolum Vitriolatum Cronstedt. Cuprum Nikelum. L.

N A T I V E F O S S I L S.

C L A S S XII.

M E T A L S.

M E T A L L A.

Heaviest of all bodies; fusible; and ductile.

G E N U S I.

G O L D.

A U R U M.

Soft; yellow; heaviest; and most ductile of all metals.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOR.	QUALITIES.	PLACE.	USES.
1. SOLID NATIVE GOLD.							
Irregular lumps	tough	heavy	smooth	FULL YELLOW	massy	Peru, China, Africa	Aurum Nativum Solidum. L.
2. PLATED NATIVE GOLD.							
Flat masses	ductile	light in the mass	glossy	PALE YELLOW	flaky	Hungary, Peru	Aurum Nativum Membranaceum. L.
3. SAND NATIVE GOLD.							
Small lumps	tough	heavy	smooth	GOOD YELLOW	in gra- nules	Africa	Aurum Nativum Fluviorum Crassius.
4. ANGULATED NATIVE GOLD.							
Small lumps	tough	heavy	polished	FINE YELLOW	in angu- lated lumps	Peru	Aurum Nativum Crystallinum. L.

5. ARBORESCENT GOLD.

Branch'd
masses

tough

heavy

twiggy

PALE
YELLOW

in form of
dendritæ

Peru

Aurum
Dendritum
N.

6. MARCASITE GOLD ORE.

Rude lumps

hard

heavy

smooth

BRASSY
YELLOW

flaky

Sweden

Pyrites
Aureus
Cronstedt.

7. PALE GOLD ORE.

Large cakes

hard

very
heavy

rugged

SILVER
COLOUR'D

striated

Hungary

Aurum
Micansibile
Cronstedt.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
8. GREY GOLD ORE.							
Small lumps	very hard	heavy	scaly	SILVERY GREY	glossy, when broke	Hungary	Aurum Ferrous Cronstedt.

Henkel was positive there could be no Gold found in Marcalites; and others have thought that in the nature of things, there could be no Gold Ore: but experiments shew there may be such; and some of the Marcalites are of the number. It were a ruinous error, to suppose all the Marcalites had Gold; but I have seen some that yield two ounces from the hundred weight in certain pieces; tho' little in others, appearing from all obvious characters to be the same.

NATIVE FOSSILS.

GENUS II.

SILVER.

ARGENTUM.

White; shining; very ductile; sonorous.

White; shining; very ductile; sonorous.

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FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USERS.
1. FLAT NATIVE SILVER.							
Thin plates	soft	heavy	granulated	REDDISH WHITE	spread on the sur- face of stone	Potosi	Argentum Nativum Superficiale. L.
2. SPANGLED NATIVE SILVER.							
Small flakes	soft	heavy	bright	WHITE	in cracks of rocks	Potosi	Argentum Nativum Bractestum. L.
3. GRANULATED NATIVE SILVER.							
Clusters of grains	soft	heavy	uneven	REDDISH WHITE	in cracks of rocks	Norway	Argentum Nativum Granulatum. L.
4. CAPILLARY NATIVE SILVER.							
Clusters of fine fibres	tender	heavy	thready	PURE WHITE	in cracks of rocks	Potosi	Argentum Nativum Capillare. L.

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FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
5. ARBORESCENT NATIVE SILVER.							
In sprigs, in stone	soft	heavy	irregular	PURE WHITE	in masses of stone	Potosi	Argentum Nativum Dendroides. L.
6. CRYSTALLINE NATIVE SILVER.							
Square shoots	hard	heavy	polished	WHITE	in stone	Norway	Argentum Nativum Crystallinum. L.
7. HORNEY SILVER ORE.							
Rude masses	brittle	heavy	glossy	PEARLY YELLOWISH BROWN	in rocks	Norway	Argentum Cornueum. L.
8. LEAFY SILVER ORE.							
Flat plates	hard	heavy	rough	BLACKISH	on stones	Saxony	Argentum Viresum Superficiale. L.

*Argentum Vitreum
Subulare.*
L.

*Argentum Vitreum
Crystallinum.*
L.

*Argentum Rubrum
Cinereascens.*
L.

*Argentum Rubrum
Solidum*
Cronstedt.

9. BRISTLY SILVER ORE.

Short spikes

brittle

heavy

pointed

DARK
GREY

in cracks
of rocks

Sweden

10. OCTAHEDRAL SILVER ORE.

Rude octa-
hedral lumps

brittle

very
heavy

polished

BROWN

in cracks
of rocks

Saxony

11. FLAKY GREY SILVER ORE.

Flat masses

brittle

heavy

rough

DARK
GREY

red, when
powder'd

Hartz forest

12. SOLID GREY SILVER ORE.

Ill-shap'd
lumps

hard

heavy

smooth

PALE
GREY

red, when
powder'd

Saxony

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
13. GLANDULOSE RED SILVER ORE.							
Small masses	brittle	heavy	rugged	FINE RED	full of rounded masses	Germany	Argentum Rubrum Glandulosum. L.
14. RUBY SILVER ORE.							
Long sprigs	brittle	heavy	polished	RUBY RED	transparent	Saxony	Argentum Rubrum Crystallinum. L.
15. WHITE SILVER ORE.							
Rude lumps	brittle	heavy	rugged	BRIGHT SHINING WHITE	glittering	Hartz forest	Argentum Album. L.
16. MASSY GREY SILVER ORE.							
Great lumps	hard	heavy	rough	PALE GREY	shining	Sweden	Argentum Cinctum vitæ Compactum. L.

17. GLOSSY GREY SILVER ORE.

Small
clusters

brittle

heavy

shining

WHITISH

angulated
figures

Sweden

Argentum Album
Crystallinum.
L.

18. PYRITIC SILVER ORE.

Flatted
lumps

brittle

heavy

rugged

WHITE

striated

Sweden

Argentum
Arcticale.
L.

19. SCALY BLONDE SILVER ORE.

Flatted
masses

brittle

heavy

tilly

LEAD
COLOUR'D

shining

Sweden

Argentum Zincosum
Squammosum
Cronstedt.

20. BALL SILVER ORE.

Round
lumps

hard

heavy

striated

GREY

bright,
when
broken

Germany

Argentum Zincosum
Rotundatum
Cronstedt.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
21. BLACK BLLENDE SILVER ORE.							
Rounded lumps	hard	heavy	scaly	BLACK	glossy, when broke	Sweden	Argentum Zincosum Nigrum Crystals.
22. STEEL-GRAIN'D SILVER ORE.							
Flatted lumps	hard	heavy	granulated	IRON GREY	glossy	Sweden	Argentum Cincereum. L.
23. SOOTY SILVER ORE.							
Ragged masses	tender	heavy	scaly	DEAD BLACK	opaque	Sweden	Argentum Nigrum. L.

NATIVE FOSSILS.

G E N U S III.
W H I T E G O L D.
P L A T I N A.

White; hard; heaviest of Metals; scarce ductile.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	C O L O U R.	QUALITIES.	P L A C E.	U S E S.
I. NATIVE PLATINA*.							
Small grains	hard	most heavy	rugged	WHITISH	opaque	Rio da Pinto	Platinum. L.

* I must express my doubts whether Platina be a Metal; or the grains we see be native, tho' they are understood to be so: 'tis near forty years ago that we became first acquainted with it. Maregrave supposed it a recrement, after amalgamation of Gold, and he found Iron in it. Its weight is not to be accounted for this way; but joined to what Maregrave has said, I may add this one, unthought of trial. Mr. Wolf, excellent in his chemical knowledge, made a preparation from this, to be dissolved and viewed in the act of recrystallizing before the microscope; and thus it afforded Figures belonging to Quicksilver, and Iron; and to no other substances in the world.

NATIVE FOS SILS.

GENUS IV.

TIN.

STANNUM*.

Blueish white; soft; malleable; crackling in bending, and but poorly ductile; fragrant.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. CRYSTALLINE TIN ORE.							
Angulated lumps	very hard	very heavy	polished	BLACKISH	crystalline	Cornwall, Saxony, and France †	Stannum Crystallinum. L.
2. TIN GRAINS.							
Small crystals	hard	very heavy	polished	BLACKISH BROWN	fatty on the surface	Cornwall	Stannum Granulatum. L.

3. TIN STONE.

Stannum
Amorphum,
L.

Large lumps

heavy

smooth

DEEP
BROWN

glossy

Cornwall

4. SPAR TIN.

Stannum
Spathaceum,
L.Round
lumps

brittle

very
heavy

streaky

PALE
BROWN

glittering

Bohemia

* It has been said, there was native Tin; but I think it is an error. A Mass was offered to me at a great price in 1731, which was an Arsenical Pyrites. Since that time, the ingenious Mr. Borlace of Cornwall, thinks he has found native Tin: The account caused letters to pass between us; in which, on my part, were proposed questions that would have determined the matter, but I am sorry to say, the answers were not satisfactory.

† It will seem strange that France is added here to the few places known to afford Tin; but 'tis mentioned, not from conjecture, but the most perfect certainty.

N A T I V E F O S S I L S.

G E N U S V.

L E A D.

P L U M B U M.

Soft; blueish white; not sonorous; very ductile.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. MASSY NATIVE LEAD.							
Oblong lumps	soft	heavy	rugged	PALE GREY	covered with white powder	Saxony	Plumbum Nativum Solidum. W.
2. GRANULATED NATIVE LEAD.							
Round granules	tender	heavy	smooth	BLUEISH	dusty white	Germany	Plumbum Nativum Granulatum. L.

3. BUBBLY NATIVE LEAD.

Small, rough
lumps

soft

heavy

raised in
bubbles

GREY

dusty
white

Germany

Plumbum Nativum
Papillare.
L.

4. CUBIC LEAD ORE.

Lumps of
cubes

hard

heavy

scaly

WHITISH

six even
sides

Germany

Plumbum Crystallinum
Hexaedrum.
L.

5. OCTOHÆDRAL LEAD ORE.

Large lumps

hard

heavy

polished

LEAD
COLOUR'Deight un-
equal sides

Saxony

Plumbum Crystallinum
Octahædrum.
L.

6. ALUMINOUS LEAD ORE.

Small masses

tender

heavy

glossy

BLUEISH

fourteen
sides

Germany

Plumbum Crystallinum
Tetraëchædrum.
L.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
7. TRUNCATED CUBIC LEAD ORE.							
Large clumps	hard	heavy	smooth	GREY	angles cut off	Sweden	Plumbum Crystallinum δ . L.
8. TWENTY-SIX-SIDED LEAD ORE.							
Loose pieces	brittle	heavy	scaly	BLUEISH	polygonal	Germany	Plumbum Crystallinum α . L.
9. CUBIC SILVER LEAD ORE.							
Vast masses.	brittle	very heavy	flaky	BLACKISH BLUE	shining mixt cubes	Germany	Plumbum Galena Cubica. L.
10. GRANULATED SILVER LEAD ORE.							
Great masses	very hard	very heavy	rugged	BLUE GREY	rich in silver	Germany	Plumbum Galena β . L.

Plumbum
Galana γ
L.

Plumbum
Compactum.
L.

Plumbum
Pauperum.
L.

Plumbum
Stibiatum.
L.

11. CONFUS'D SILVER LEAD ORE.

Rugged
lumps

hard

heavy

12. COMPACT LEAD ORE.

Vast masses

hard

very
heavy

13. DOTTED LEAD ORE.

Great masses

hard

heavy

14. ANTIMONIATED LEAD ORE.

Great cakes

brittle

very
heavy

Germany

glittering
confusedly

IRON GREY

scaly

Germany

uniform

BLUEISH

smooth

Germany

shining in
dots

BLUE GREY

uneven

Sweden

striated

LIGHT
GREY

rugged

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USE S.
15. CLUSTER LEAD ORE.							
Rude lumps	brittle	heavy	streaky	BRIGHT GREY	cross tufts of fibres	Germany	Plumbum Basilinum. L.
16. GREEN LEAD ORE.							
Clusters of crystals	hard	very heavy	irregularly streak'd	GREEN, OR COLOUR- LESS	nitrous crystals	Bohemia	Plumbum Virescens L.
17. RUSSIAN LEAD ORE.							
Great masses of rhombs	hard	heavy	glossy	TAWNY	bright	Russia	Plumbum Rhombium. L.
18. SPARRY LEAD ORE.							
Vast cakes	brittle	heavy	flaky	WHITE	breaks in cubes	Germany	Plumbum Spatiosum. L.

Plumbum
Pellicidum.
L.

Plumbum
Caliciforme
Cronstedt.

19. PELLUCID LEAD ORE.	heavy	rugged	COLOUR- LESS	easily scraped	Germany
20. CERUSS LEAD ORE.	brittle	dusty	WHITE	on lead ores	Sweden
Great lumps	hard				
Thin cakes					

S.

L

A

T

E

M

VI.

U

S

G

R.

P

P

C

M.

R

U

C

Ruddy; tough; sonorous.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. MASSY NATIVE COPPER.							
Thick pieces	tough	heavy	rugged	REDDISH	solid	Virginia	Cuprum Nativum Solidum.
2. PLATED NATIVE COPPER.							
Flat cakes	very ductile	heavy	uneven	REDDISH	dull	Germany	Cuprum Nativum Superficiale. L.
3. FOLIACEOUS NATIVE COPPER.							
Irregular flakes	soft	heavy	uneven	RED	bright	Sweden	Cuprum Nativum Foliosum. L.
4. EFFLORESCENT NATIVE COPPER.							
Flat, fibrous masses	tender	heavy	rugged	FINE RED	granulated	Germany	Cuprum Nativum Efflorescent. L.

5. CEMENT COPPER.

Rugged
cakes

brittle

light

rugged

DULL
REDDISH

botryoid

Germany

on iron.

Cuprum
Precipitatum.
L.

6. OCTAHEDRAL COPPER ORE.

Small lumps

hard

heavy

polished

REDDISH

trigonal
faces

East Indies

Cuprum
Crystallinum.
L.

7. RED GLASSY COPPER ORE.

Great masses

very hard

heavy

rugged

SCARLET

glassy
within

Norway

Cuprum Induratum
Rubrum
Cristallit.

8. TAWNY GLASSY COPPER ORE.

Great cakes

hard

heavy

wrinkled

YELLOWISH
BROWNglassy
within

Sweden

Cuprum Induratum
Fulvum
Cristallit.

FOR M.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USE S.
9. GREY MARCASITIC COPPER ORE.							
Great lumps	hard	heavy	rugged	BRASSY BLACKISH GREY	striated	Germany	Cuprum Marcasiticum Griseum Cronstedt.
10. LIVER-COLOUR'D MARCASITIC COPPER ORE.							
Flat masses	very hard	heavy	coated	LIVER COLOUR'D	abluecrust	Sweden	Cuprum Marcasiticum Lazureum Cronstedt.
11. COMPACT BRASSY COPPER ORE.							
Great cakes	hard	heavy	smooth	GREENISH	breaks like brass	Germany	Pyrites Cupri Solidus Cronstedt.
12. STEEL-GRAIN'D BRASSY COPPER ORE.							
Flat masses	hard	very heavy	rough	BRONZ'D YELLOW	breaks like iron	Sweden	Pyrites Cupri Chalybeiformis Cronstedt.

13. SANDY BRASSY COPPER ORE.

Great lumps brittle heavy

14. OCTOHÆDRAL BRASSY COPPER ORE.

Clusters of crystals shattery heavy

15. GOLDEN MARCASITIC COPPER ORE.

Great cakes hard heavy

16. BROWN MARCASITIC COPPER ORE.

Flat cakes brittle heavy

GREENISH
YELLOW

rugged

glittering
Sweden

YELLOW

angulated

octohæ-
dral
prisms
SwedenPALE
YELLOW

scaly

glittering
SwedenRUDDY
BROWN

flaky

bright
GermanyPyrites Cupri.
Crassior.
Crassetti.Cuprum Crystallinum
Octahedrum
Crassetti.Pyrites Cupri Pallide-
Flavus
Crassetti.Pyrites Cupri
Hepaticus
Crassetti.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
17. COMPACT GREY COPPER ORE.							
Rude lumps	tender	heavy	etchy	DARK GREY	cuts like black lead	Sweden	Minera Cupri Sulphurata Solida Crystallized.
18. CUBIC GREY COPPER ORE.							
Flat masses	soft	heavy	smooth	IRON GREY	breaks in cubes	Sweden	Minera Cupri Sulphurata Cubica Crystallized.
19. ARSENICAL COPPER ORE.							
Rude lumps	brittle	heavy	granulated	WHITE	shining	Saxony	Cuprum Albidum. L.
20. STONY COPPER ORE.							
Coarse masses	brittle	light	cavernous	RUDDY BROWN	coarse	Siberia	Cuprum Corticatum. L.

21. GREEN SLATY COPPER ORE.

Flat cakes	hard	heavy	plated	DEEP GREEN	splits in thick plates	Germany	Cuprum Schistofum α . L.
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22. BLUE SLATY COPPER ORE.

Vast cakes	tender	light	scaly	DEAD BLUE	splits in thin scales	Sweden	Cuprum Schistofum β . L.
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23. LAZULAR COPPER ORE.

Large masses	very hard	heavy	smooth	FINE BLUE	white and gold spots	Asia	Cuprum Lazuli. L.
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24. ARMENINE COPPER ORE.

Great lumps	hard	heavy	rugged	PALE BLUE	fine	Asia	Cuprum Armenus. L.
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FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
25. MALACHITE COPPER ORE.							
Rude lumps	firm	heavy	kidney'd	FINE PALE BLUE	striated within	Bohemia	Cuprum Malachites. L.
26. BLUE EARTHY COPPER ORE.							
Small cakes	brittle	light	dusty	GOOD BLUE	clay-like	Saxony	Ceruleum Montanum Cronstedt.
27. GREEN EARTHY COPPER ORE.							
Rough lumps	tender	light	uneven	GREEN	ochreous	Germany	Viride Montanum Cronstedt.
28. RED EARTHY COPPER ORE.							
Thin cakes	soft	light	botryoid	RED	crumbly	Bohemia	Rubrum Montanum Cronstedt.

Nigrum
Montanum
Cronstedt.

Cuprum
Lithanthracum
Cronstedt.

29. BLACK EARTHY COPPER ORE.

Small lumps brittle light

30. COAL COPPER ORE.

Great cakes hard heavy

Sweden

Germany

crumbly

yellow spots

DEEP
BLACK

BLACK

dusty

flaky

3 E 2

M E T A L S.

GENUS VII.

IRON.

FERRUM.

Dark blue grey; glittering; sonorous; only malleable when hot.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. NATIVE IRON.							
Small, round lumps	hard	heavy	polished	RUDDY GREY	oily surface	Sweden	Ferrum Nudum. L.
2. RHOMBIC IRON ORE.							
Masses of rhombs	hard	heavy	smooth	RUDDY BROWN	bright, when broke	Sweden	Ferrum Teffulare. L.
3. CUBIC IRON ORE.							
Small cubes	tender	heavy	glossy	BROWN	regular cubes	Germany	Talcum Cubicum. W.
4. * POLYHÆDRA IRON ORE.							
Rude lumps	hard	heavy	smooth	REDDISH	many faces	Sweden	Minera Ferri Polyhædra Cronstedt.

Minera Ferri
Cellularis
Cronstedt.

Ferrum
Crystallinum.
L.

Ferrum
Chalybeatum.
L.

Ferrum
Siderum.
L.

5. HONEYCOMB IRON ORE.

Great cakes | hard | heavy

6. CLUSTER IRON ORE.

Small, rude | shattery | heavy
lumps

7. STEELY IRON ORE.

Vast cakes | very hard | very
heavy

8. BLACK DOTTED IRON ORE.

Great lumps | hard | heavy

RUDDY
BROWN

Sweden

glossy

composed
of small
octohæ-
dres

Sweden

GLOSSY,
REDDISH

most
irregular

DEEP
GREY

Sweden

compact

BLACKISH

Sweden

rhombic
spots

* This Ore, when bedded in Limestone, acquires an addition of Sulphur, which it has in no other state. The excellent Cronstedt found this always: it happily comes in to the support of the doctrine of Sulphur, delivered in a preceding part of this work, under the article Spar.

FOR M.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
9. BLACK PLAIN IRON ORE.							
Vast masses	very hard	heavy	rude	DEEP BLACK	breaks in rhombs	Sweden	Ferum Rhombicum. L.
10. LIVER IRON ORE.							
Great cakes	hard	heavy	even	LIVER COLOUR'D	breaks in rhombs	Sweden	Ferum Hepaticum. L.
11. STEEL-GRAIN'D IRON ORE.							
Great masses	very hard	heavy	rugged	RUDDY BROWN	black, when powder'd	Sweden	Ferum Selectum. L. finest of ores.
12. FINE-GRAIN'D IRON ORE.							
Vast lumps	very hard	very heavy	smooth	BLACK	sparkling	Sweden	Minera Ferri Retragoria Compacta Cronstedt.

Minera Ferri.
Retraetoria Grolfior
Crustifed.

Ferrum
Arenosum.
L.

Ferrum
Commune.
L.

Ferrum
Molle.
L.

13. GRANULATED IRON ORE.

Great masses hard heavy

Sweden

coarse

RUDDY
BLACK

rough

14. SANDY IRON ORE.

Vaſt cakes hard heavy

Sweden

particles
like ſand

BLACKISH
GREY

rugged

15. COMMON IRON ORE.

Great cakes hard heavy

Germany

irregular
particles

BLACKISH

rough

16. SOFT IRON ORE.

Rugged
lumps hard heavy

Sweden

ſpangles of
marcaſite

BLACK

rugged

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
17. TALCY IRON ORE.							
Vast rocks	hard	heavy	scaly	DARK GREY	white spangles	Sweden	Ferrum Talcosum. L.
18. MARBLE IRON ORE.							
Great maffes	brittle	heavy	irregular	BROWN	black shining grains lines	Sweden	Ferrum Calcarium. L.
19. LINEATED IRON ORE.							
Great lumps	brittle	heavy	streaky	RUDDY BROWN	forming rhombs	Sweden	Ferrum Decussatum. L.
20. GREEN IRON ORE.							
Rude pieces	brittle	heavy	rugged	GREEN	specks of ruddy brown	Sweden	Ferrum Virens. L.

21. GRANITE IRON ORE.

Great masses tender heavy

scaly

GRANITE,
LIKE
BLACK AND
WHITE

shining
black
scales

Sweden

Ferum
Squamosum,
L.

22. FINE-GRAIN'D EMERY.

Vast cakes hard heavy

uneven

STEEL
COLOUR'D

reddish in
powder

Greek
Islands.
Peru

Ferum
Smiris,
L.

for polishing
gems.

23. HARSH EMERY.

Great lumps hard heavy

rugged

REDDISH
GREY

coarse
grain'd.

Sweden

Smiris
Chalybeatus
Crostedt.

24. CUBIC EMERY.

Rude masses shattery heavy

most
irregular

REDDISH

glossy
cubes

Sweden

Smiris
Cubica
Crostedt.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
25. FLAKY EMERY.							
Flat cakes	brittle	heavy	scaly	RUDDY GREY	thick scales	Sweden	Smaris Squammosa Cronstedt.
26. GLIMMERY IRON ORE.							
Vast lumps	brittle	light	rugged	DARK GREY	shining scales	Sweden	Ferrum Micaceum. L.
27. BLUE IRON ORE.							
Great cakes	hard	heavy	plated	STEEL GREY	blue scales	Sweden	Ferrum Ceruleum. L.
28. FIBROSE IRON ORE.							
Rude lumps	brittle	heavy	fibrose lines, rhombic forms	REDDISH GREY	breaks into rhombs	Sweden	Ferrum Striatum. L.

29. HONEYCOMB IRON ORE.								Ferrum Cellulosum. L.
Rugged lumps	brittle	heavy	regularly cavernous	IRON GREY	upright, bright flakes	Sweden		
30. RED BLOODSTONE*.								Ferrum Hæmatites 6. L.
Rounded lumps	hard	heavy	raised in great glo- bules	FINE RED	glossy, striated within	forest of Dean		
31. BLACK BLOODSTONE.								Ferrum Hæmatites 6. L.
Rounded masses	hard	heavy	botryoid	BLACK	shining	Germany		
32. BLUE LIMESTONE.								Ferrum Hæmatites 7. L.
Rugged masses	hard	heavy	raised in blunt cones	DEEP BLUE	glossy	Germany		

* The Emerites and Bloodstones are all Iron Ores. The Loadstone is an Iron Ore, which has the quality of attraction, nothing more.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
33. SOLID YELLOW BLOODSTONE.							
Rounded lumps	hard	heavy	rounded and smooth	PALE YELLOW	glossy	Sweden	Ferrum Hematites 2. L.
34. FIBROUS YELLOW BLOODSTONE.							
Rough masses	hard	heavy	smooth	DEEP YELLOW	thick fibres	Bohemia	Ferrum Hematites Flavum Striatum Crocated.
35. KIDNEY BLOODSTONE.							
Cluster'd lumps	hard	heavy	botryoid	BLACK	rhombic, when broke	Sweden	Hematites Resiformis Nigrescens Crocated.
36. RADIATED BLACK BLOODSTONE.							
Masses of globes	hard	heavy	cluster'd round lumps	BLACK	thick striae within	Sweden	Hematites Niger Radiatus Crocated.

Hæmatites Niger
Crystallatus
Cronstedt.

Hæmatites Ruber
Solidus
Cronstedt.

Hæmatites
Crystallatus
Cronstedt.

Ferrum
Rubricolum,
L.

37. FIGUR'D BLACK BLOODSTONE.

Rugged
lumps

hard

heavy

38. SOLID RED BLOODSTONE.

Vast lumps

hard

heavy

39. CRYSTALIZ'D RED BLOODSTONE.

Small masses

hard

heavy

40. STAINING BLOODSTONE.

Great lumps

soft

very
heavy

DEEP
BLACK

crystaliz'd
within

Sweden

FINE RED

compact,
as flint

Germany

DEEP RED

crystaliz'd
within

Germany

GOOD RED

stains the
hands

Germany

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
41. SANDSTONE IRON ORE. Vast masses	brittle	heavy	rugged	BLACKING THE HANDS	full of sand	Sweden	Ferum Arcuosum, L.
42. REGENERATE IRON ORE. Vast masses	brittle	heavy	most uneven	RUSTY YELLOW	sandy, formed on iron	Sweden	Tophus Marinus, L.
43. GLOMERATE IRON ORE. Great lumps	shattery	heavy	rugged	DARK GREY	of loofe octohæ- dral par- ticles	Sweden	Ferum Glomeratum, L.
44. GREY IRON ORE. Great masses	brittle	heavy	rough	WHITISH GREY	breaks in rhombs	Sweden	Ferum Spatiosum, L.

45. THE LOADSTONE.

Ferrum
Magneti.
L.

Great lumps hard heavy

Germany,
Italy

attracts
iron, and
has its
poles

46. SOFT MANGANESE*.

Magnesia
Terra
Cronstedt.

Crumblly
masses soft heavy

England

in glass works.

friable

47. WHITE GLOBULAR MANGANESE.

Magnesia Alba
Mineralis
Cronstedt.

Rounded
masses hard heavy

Norway

striated
within

48. PURPLE MANGANESE.

Magnesia
Rubra
Cronstedt.

Rude masses hard very
heavy

Italy

radiated
within

* The Manganefes are Iron Ores; but so poor, some have deny'd them their place among these bodies. The excellent Cronstedt is one of those; and he is a guide in these matters, one would wish to follow; but I have try'd them, and there is not one but has some Iron. Experiment is the test to which I would reduce all opinions; and that obliges me to place the Manganefes among the Iron Ores, tho' last among them.

FOR M.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
49. SOLID MANGANESE.							
Great lumps	shattery	heavy	smooth	PURPLISH	metalline brightness	Germany	Magnesia Solida Cronstedt. in glass works.
50. STEEL-GRAIN'D MANGANESE.							
Large cakes	hard	heavy	rugged	IRON GREY	bright, and shining	Sweden	Magnesia Chalybeata Cronstedt.
51. RADIATED MANGANESE.							
Great lumps	shattery	heavy	streaky	REDDISH	radiated within	Sweden	Magnesia Radiata Cronstedt.
52. KIDNEY'D MANGANESE.							
Connected balls	brittle	heavy	kidney'd	REDDISH GREY	glossy	Sweden	Magnesia Crystallifera Cronstedt.

53. WOLFRAM MANGANESE.

Magalia Spuma
lupi
Cronstedt.

Rude lumps

hard

heavy

freaky

IRON GREY

coarse
fibres

Sweden

F O S S I L S.

3 Q

C L A S S XIII.

S L A G S.

S C O R I Æ.

Mineral bodies, calcin'd by subterranean fires.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. ICELAND AGATE.							
Rough cakes	hard	heavy	undulated	GREENISH BLACK	semi- transpa- rent	Mount Hecla, and Ascension Island	Achat Islandicus Cronstedt.
2. RHINLAND MILSTONE.							
Vast masses	hard	heavy	cavernous	BLACK	glass-like	Germany	Lapis Molaris Rhenacus. L.
3. PEARL SLAG.							
Clusters of globules	hard	heavy	botryoide	GREENISH GREY	glassy	Isle of Af- cension	Scoria Margaritacea Cronstedt.
4. ASHY SLAG.							
Granulated dust	tender	light	rough	GREY	crumbly	Vesuvius	Scoria Pulverulenta Cronstedt.

5. L A V A S L A G.	Rude lumps	hard	heavy	rugged	MIX'D OF ALL CO- LOURS	glassy	Vesuvius	Scoria Lava. H.
6. COMMON GREY PUMICE.	Irregular lumps	brittle	light	cavernous	OLIVE GREY	of bristly fibres within	Vesuvius, Ætna	Pumex Vulcani. L.
7. BLACK PUMICE.	Vast cakes	brittle	light	rugged	BLACK	sponge- like.	Vesuvius	Pumex Niger Cronstedt.
8. IRON PUMICE.	Flat masses	brittle	heavy	botryoide	PALE REDDISH	spongy	Volcanos, and Iron Forges	Pumex Fermi. L.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
9. COPPER PUMICE.							
Great-masses	brittle	light	frothy	RED	spongy	Isle of Ascension	

Pumex
Capri.
L.

These are a sort of additional substances to a Fossil catalogue; but they ought to have a place in a cabinet: indeed the Lawas of Vesuvius might make a cabinet alone: but Philology must acknowledge it knows little of them.

We should wish to be acquainted with the history of the Fossils, of which they are calcinations, in their native and original state, and that way to be able to refer them to the bodies to which they belong; but of this we have no hope. We know not what were the Fossils of Vesuvius before they were burnt; nor can all the furnaces of chemistry produce such substances as these volcanic fires of nature.

F I N I S.

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